

THE RAILWAY GAZETTE
 A Journal of Management, Engineering and Operation
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GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE in that the size of the page has been reduced from 9 in. x 12 in. to 8½ in. x 11½ in. The type area of the page remains the same, namely, 7 in. x 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:

Mondays to Fridays 9.30 a.m. till 5 p.m.

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

First Class Travel

CONTROVERSY as to the desirability of maintaining or abolishing first class travel facilities on the railways throughout the country shows no sign of abating. The subject is enjoying a wide measure of favour among those who write letters to the Press, and there can be no question that from the point of view of the general public this topic is being well ventilated. In our October 9 issue we recorded a statement by the Ministry of War Transport denying the accuracy of rumours that first class travel on day trains throughout the country was to be abolished shortly. Attention was also drawn to a detailed study of the financial effects of abolishing first class tickets which appeared in THE RAILWAY GAZETTE for July 12, 1935. At that time the conclusion was reached that the direct loss in revenue would be £2,766,000 a year and the total possible economies not more than £1,000,000 a year. Of the economies, about £250,000 was estimated as a saving in coal; in present circumstances, of course, it has to be borne in mind that this saving could not be made, for trains are now so crowded that there is no waste space in first class carriages, and it is unlikely that any reduction would be effected in the weight of trains. Further, in view of the considerable reduction in first class travel facilities which has been made already, the financial saving which could be effected at the present juncture must necessarily be very slight, if indeed any were possible of achievement.

Civil Promotion while on Active Service

Reference was made in our February 27 issue to the promotion of railway servants while they are taking part in military or other forms of national service, in cases in which a post falls vacant for which they would be considered in normal circumstances. The L.N.E.R. has made a practice of advertising vacancies among its staff. Members of the clerical staff of this company on active service are considered for promotion to positions for which they might have applied, had they been working at the time with the company, and recently a L.N.E.R. clerk, who is serving as a second lieutenant in India, sent to his department in London an application for a post by airgraph. The L.N.E.R. sends to each member of its salaried staff who joins the Armed Forces a form, on which he is asked to record his preference in the matter of the locality, department, and other aspects of any job which may become vacant in his absence, and for which his qualifications and experience may render him suitable for consideration. If he is appointed, on his return to civil life he will take up his new duties and will enjoy the salary and seniority commensurate with them. One such form was sent to a Goods Department clerk in an Italian prisoners-of-war camp and was received back recently duly completed. Many prisoners-of-war also are helping to prepare themselves for new responsibilities in civil life, as has been recorded in our columns, by means of study groups and examinations arranged by the Institute of Transport.

The Basis of Freight Comparisons

Hitherto, in their freight statistics, the Office of Defense Transportation and the railways of America have made much of the number of freight wagons loaded in any given period as a measure of the unprecedented increase of traffic which the railways are handling. It is now realised, however, that this basis of comparison is inadequate, for it takes no account of the success which is attending the drive for increasing the average load of each wagon. In May last the O.D.T. ordered that from that date the contents of wagons carrying miscellaneous freight, or "less-than-carload" traffic, must not be less than 6 tons, to be increased to a minimum of 8 tons on July 1, and 10 tons on September 1. By careful methods of concentration, such as special "sailing dates" from loading points to different destinations, and so on, the September target was reached on some routes by mid-June, and the expectation was that many of the larger lines would be carrying an average of 12 to 14 tons of l.c.l. freight in each wagon by September. As a result, whereas in the eight weeks from May 1, 1941, 1,273,732 were loaded with l.c.l. miscellaneous merchandise, in the same eight weeks this year the total had dropped to 777,981, representing release of roughly half-a-million wagons for other urgent service. The increase in loading efficiency may be measured by the fact that whereas the total number of wagons loaded with all descriptions of freight in the first quarter of the year rose from 9,386,985 in 1941 to 10,152,485 in 1942, or by 8.2 per cent., the revenue tonnage loaded increased from 478,521,196 to 576,211,670, or by 20.4 per cent., while the ton-mileage rose from 101,375,401,000

to 132,028,605,000, or by 30.2 per cent., and this is entirely apart from the improvement in l.c.l. loading effected from May onwards.

Promontory Point

Among the changes in the United States wrought by the war is one of sentimental interest, to which brief reference has already been made in our columns. It amounts to the dismantling of the section of railway track which completed the first transcontinental railway in America. This step was authorised recently by the Interstate Commerce Commission when it sanctioned the abandonment of the 121 miles of line between Lucin (Utah) and Corinne Junction, owned by the Central Pacific Railroad, now a part of the Southern Pacific system. Reference to this was made in a B.B.C. broadcast on September 12 in Mr. Ernest K. Lindley's American Commentary, when he pointed out that the track in question was laid 73 years ago in the mountain state of Utah and joined a railway built east from California with one run west from the Central Plains. On May 10, 1869, the last rail in the link was fixed ceremoniously by driving a golden spike at Promontory Point, where the Central Pacific line met that of the Union Pacific. During the week that Mr. Lindley was speaking, far less elaborate ceremonies were held at the same spot, as crowsbars were thrown under the rails to begin the process of lifting. The rails have been bought by the United States Navy, and are being relaid in naval supply depots and bases in various parts of the West. For many years this section of rail has been used only for local traffic, as transcontinental traffic now passes through Utah on the shorter line provided by the Lucin cut-off, and of course there are now other routes both to the north and to the south.

Overseas Railway Traffics

Far the largest traffic increase amongst British-owned Argentine railways in the 13th and 14th weeks of the current financial year is that of £45,420 shown by the Buenos Ayres & Pacific. Next come the £20,610 advance on the Central Argentine, that of £8,034 on the Entre Rios, the increase of £5,580 on the Buenos Ayres Great Southern, and that of £4,806 on the Argentine North Eastern. On the Buenos Ayres Western, however, there is a net decrease of £8,100 for the two weeks. For the year to date Argentine North Eastern receipts are £19,062 up, whereas those of the Entre Rios are £738 down. At this time a year ago all six companies showed increases in comparison with the first 14 weeks of 1939-40, namely:—Central Argentine £335,082, Buenos Ayres Great Southern £179,280, Buenos Ayres Western £148,200, Buenos Ayres & Pacific £135,960, Entre Rios £49,770, and Argentine North Eastern £22,278.

	No. of week	Weekly traffics	Inc. or decrease	Aggregate traffic	Inc. or decrease
Buenos Ayres & Pacific*	14th	92,580	+ 21,720	1,178,940	+ 104,040
Buenos Ayres Great Southern*	14th	143,640	+ 3,900	1,764,600	+ 21,300
Buenos Ayres Western*	14th	50,700	+ 180	674,640	+ 8,040
Central Argentine*	14th	126,408	+ 13,740	1,692,081	+ 177,933
Canadian Pacific	39th	1,407,800	+202,600	37,425,200	+5,733,800

* Pesos converted at 16½ to the £

Canadian Pacific Railway gross earnings for the first eight months of 1942 amounted to £33,002,600, an increase of £5,164,800 over those for the corresponding period of 1941, and the net earnings of £5,687,400 showed an improvement of £435,200.

Electrification of Works Sidings

Most factories and industrial establishments have their own private railway sidings and the larger ones covering many acres of ground may comprise a fairly extensive private network of lines enabling wagons of all kinds to be brought to the most suitable places for loading and unloading. On systems of this kind haulage is sometimes undertaken by horses, but far more often in these days a locomotive is provided. Steam locomotives (including the fireless variety) and those powered by diesel or petrol engines are widely used, but in most factories electric power has been adopted in every field other than that of transport, and it is only logical therefore that consideration should ultimately be given to the merits of the electric shunter. One obvious advantage is that it can be understood and kept in a good state of repair by men who are already employed on electrical maintenance work. The other types of locomotive necessitate the engagement of a man with special qualifications or, alternatively, the existence of some agreement with the makers under which expert attention will be provided at regular intervals. A drawback of the electric shunter is the need for overhead wires to supply it with motive power. Many electric shunting locomotives are equipped with a battery for their operation on sections where overhead wires cannot be provided and to enable them to proceed outside the works on to lines

belonging to the railway company. The English Electric locomotives described elsewhere in this issue are complete in this respect, and they offer a ready solution to local transport problems.

An Interesting Rolling Stock Conversion

Although the rebuilding and conversion of locomotives is a well recognised process, practised as occasion arises on railways in all parts of the world, its application to rolling stock vehicles is more unusual. An interesting example which may, indeed, be considered as almost unique is the conversion on the Southern Railway of some electric locomotives to new uses as eight-wheel, double-bogie brake vans. The locomotives, 21 in number, which had been earlier purchased by the L.B. & S.C.R. for service on the Coulsdon—Wallington branch line, were designed for use with a.c. current and as at the time of the amalgamation the decision had been reached to adopt d.c. current for the Southern Railway electrification system in continuation of the practice previously followed on the L.S.W.R., some other use had to be found for them. Various schemes were put forward for the utilisation of the locomotives but none of them found favour, and finally it was decided to convert them to goods brake vans. The electrical equipment was therefore stripped out of the locomotives and the necessary alterations made. The adoption of this plan to some extent resulted from the fact that due to intensive road competition it had become necessary to accelerate the West of England goods train services by running fully vacuum-fitted trains, and it was realised that the vehicles when adapted to their new purpose would provide a desirable standard of comfort for the guards working such trains. These earlier converted vehicles formed the prototype of 25 others built at a later period, one of which together with the four-wheel type of goods vans on the Southern Railway are illustrated and described on pages 372-374 of this issue.

The Carbon Content of Rails

At various American mills, the quality of rail steel has lately been put under the direct control of the metallurgical departments, with advantage to quality in greater uniformity of composition and physical properties of the steel. In particular, instead of reducing the carbon in the furnace to 0.15 per cent. or thereabouts, and then adding carbon shortly before tapping the furnace in the quantity necessary to give the predetermined analysis, the present practice is to catch the carbon in course of reduction at near the top limit of the analysis, and then, by skilful manipulation, to tap the charge at as near the middle of the specified carbon range as possible. This procedure has been simplified by an instrument known as the Carbometer, which allows a very rapid and accurate estimate to be made of the percentage of carbon in a sample from the furnace. This method tends to reduce the time that a cast of steel occupies in the furnace, with advantage both to output and to the quality of the steel itself. At one plant using the method, during a period of two years 85 per cent. of the heats of rails made for the New York Central System had carbon contents within a range of 0.07 per cent., and it was not necessary to reject any cast on account of failures at the falling weight test. It may here be said, however, that such precision of analysis is by no means unusual in Great Britain, where the standard rail steel composition, with its carbon range of 0.10 per cent., is normally conformed to with very little difficulty.

Railway Pensioners in Wartime

An attempt is being made in the United States Congress, in a bill introduced by Representative Van Zandt, a Republican of Pennsylvania, to secure the provision of minimum pensions and annuities of \$50 a month for all railwaymen with 30 years and over of service who retire at 65 years, or by reason of total disability at an earlier age. In the July 9 "Congressional Record" the introducer of the bill gave figures showing that nearly half the existing railway pensioners, who number 31,080, and roughly one-third of the 113,183 annuitants, are receiving less than \$50 a month; the pensioners are those taken over from the former railway pension systems, and the annuitants are those who have retired since the Railroad Retirement Act became law. As the Railroad Retirement Board has stated that it is out of the question to increase the compulsory contribution of either the railways or their employees, Mr. Van Zandt's bill is designed to secure that the annual additional cost of \$4,620,000 shall be footed by the Federal Government. Justification for this proposal is found in the claim that the Federal Government would in this way be contributing to the railway retirement system no more than it would do if the railway employees were covered by its own social security plans. In any event, a strong move-

ment is on foot to make the provisions of the Railroad Retirement Act more liberal, and the railroad Retirement Board has for some time past had under consideration ways and means of liberalising the disability retirement provisions and giving more adequate benefits to dependents.

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Fuel Efficiency on the Railways

The main-line railways are making every effort to assist in the conservation of the nation's supplies of coal, and to this end various expedients have been put into force by the companies. Two which have been put into effect on the L.M.S.R. and which have reduced locomotive fuel consumption, are an extension of a method of controlled firing under which fuel is fed at approximate regular intervals into the firebox throughout the run, and the practice by certain locomotive sheds of setting a target of reduction in coal consumption for each mile travelled by the locomotives at that shed. One shed has set itself the task of achieving a saving of 5 lb. a mile, and this is in fair way of being achieved. It has become a practice, also, for locomotives from at least one depot in the South, when going to stations in the Midlands or the north, to carry no more coal than is necessary for the journey and a reasonable margin of safety. Before commencing to run south, however, tenders are filled to capacity with coal. The result of this practice of loading coal near the pits has been to produce considerable economies in the transport of fuel; in the case of one locomotive depot on the L.M.S.R., a saving has been effected of one train-load of coal a fortnight.

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Railways and Trade

IN a recent issue of *The Railway Review* a "Railway Economist" contributed an article, the ostensible purport of which was to give prominence to "the immense debt due to the railways" and to appreciate which, it was suggested, a study of the history of the rise of Great Britain as an industrial power is essential. In fact the true objective of the article seems to be the special pleading contained in a few lines at the end, where is met the familiar suggestion that "it is obviously high time that the dead hand of the present managements was removed, and the railways placed under complete State ownership—for administration on the lines of the London Passenger Transport Board." It is not with that conclusion that we are concerned at the moment—it has been dealt with on many occasions in our columns—but rather with some of the steps by which a "Railway Economist" arrives at it. He traces the trade development of England from 1700 onwards, and points to the great expansion of commercial and industrial life which was wrought with the development of the railways, and he touched also on the position in the United States and Germany during that time. He goes on to say that with increasing traffics, supplemented by continual improvements in operating methods, those countries were able to bring down transport rates, whereas in Great Britain they remained practically stationary, and that any tendency to movement was almost invariably upward. He illustrates these conditions by saying that American rates gradually fell from 2½ cents a ton-mile in 1875, to under 1 cent a ton-mile in 1914, notwithstanding the fact that wages had been raised to twice as much as in England, and that British rates rose in the same time from an average of 2½ cents a ton-mile to 3½ cents a ton-mile. Just how he arrives at these figures is a mystery, for ton-mile figures were not generally compiled by British railways between 1875 and 1914, and the average rate per ton-mile for all freight traffic in 1937 was only 1.308d., as shown by the statistics published by the Ministry of Transport. Further, he omits any reference to the very much greater average length of haul on the American railways, which is at least as important as the average rate per ton-mile.

The position of the coal industry is briefly examined and it is said that the total railway bill on coal rose from £17,000,000 in 1917 to £34,000,000 in some year—not stated—for an equal tonnage, and that, although it has been claimed that a saving of £8,000,000 would have restored prosperity to the mines, practically nothing has been done to reduce these charges. That, of course, in no way accords with the facts and the author would appear either to have no knowledge of his subject or to ignore all known facts in regard to the coal industry. For example, he infers that coal exports from Britain have declined by 50 millions since 1917, whereas the total coal exports in that year, including foreign bunkers, were only 45 millions! He also criticises British methods of handling coal at the docks in comparison with those in America and Germany, and puts forward the claim that whereas the rate of shipping coal at British ports is at about 600 tons an hour, the American rate is 2,000 and 3,000 tons an hour. He has evidently not troubled to ascertain the views of the coal trade on this question and appears to

have no knowledge of the efforts made by the railways to introduce high capacity wagons. The criticisms which he levels at the railways go a long way; blaming them on the one hand for high charges and the destruction thereby of export trade, and on the other of failing to pay good wages and to pay dividends on great amount of capital, he finds that the reaction of loss of exports and the subsequent increase of unemployment and loss of purchasing power "undoubtedly all contributed to the creation of the present war." Declaring that some twelve years ago many leading politicians called for a radical overhauling of the railway companies' methods and advocating that the time has come when the panacea of his party should be applied, he concludes that "the companies have lost all the initiative, enterprise, and energy that characterised them 100 years ago." This can also be considered as another flight of the author's imagination.

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A Signalling Pioneer

THE death of Mr. J. E. Spagnoletti, recorded on page 376, recalls to mind the work of his father in the field of signalling. Numbers of railwaymen who are familiar with the customary design of the widely-used signal repeater and similar indicators, have probably heard little, if anything, of its inventor, who passed away some 25 years ago. Charles Ernest Paolo Della Diana Spagnoletti was born in London on July 12, 1832, and was descended from a high Neapolitan family named Della Diana. His grandfather, Paolo Ludovico Della Diana, was a gifted musician, whose success in Spain brought him the affectionate and appreciative appellation of "Spagnoletto" (literally, "Little Spaniard"); this he adopted as a surname, with the slight (plural) modification of final i for o. Emigrating to London, he achieved a high position in the musical world. On leaving school at the age of 14, C. E. Spagnoletti was employed by the electrician, Alexander Bain, inventor of a form of electro-chemical telegraph. On the formation of the Electric Telegraph Company in 1847 he entered its London offices in Lothbury and in 1855, when only 23 years of age, was appointed to take charge of the Telegraph Department of the G.W.R., which post he held until 1892. He at once directed his attention to block signalling, and for the opening in 1863 of the first section of the Metropolitan Railway, which was worked on the absolute block system from the first day, produced his well-known disc type block telegraph instruments, which remained in use there until superseded by automatic signalling in recent years. They were also adopted by the Great Western Railway, where they are still standard, and by a few railways in other countries, and were used for a time on the District Railway. Speaking at a meeting of the Institution of Civil Engineers in January, 1863, T. Marr Johnson, Resident Engineer of the Metropolitan Railway, said that Spagnoletti's instruments had received the "unqualified approval" of John Fowler, the well-known engineer, and proved very satisfactory. Half a million people had been carried in three weeks, and some train intervals were only four minutes. "No mistake had been made in the working."

These instruments, in common with the ordinary needle telegraphs of the day, had permanently magnetised needles inside the operating coils and were liable to be influenced adversely by lightning effects. In 1869, therefore, Spagnoletti invented and patented his well-known divided induced needle, or axle, the device with which his name has ever since been associated in the minds of railwaymen, and deservedly so, for it has been used more than any other electrical device in railway service, at least in Great Britain and the British Empire. Strangely enough, it appears to have found very little application elsewhere, which is all the more striking in view of the fact that it is a very efficient piece of mechanism, and attempts to bring forward a substitute have not as yet found much favour. Although holding a railway appointment—it is said, at a relatively modest remuneration for some time—Spagnoletti engaged in business for himself also, and supplied railway telegraph material to other lines, here and abroad. He early advocated electric in place of mechanical locking, and what is now called intermediate signalling, but, in common with other inventors then, he had to rely on electric treadles to control it, and such proposals were rightly considered not good enough for main-line conditions. He installed some electrically-operated semaphores in 1875 on the Inner Circle between Præd Street and Queen's Road, but with what results is not known. Presumably the railway did not consider them to bring any advantage, as they eventually disappeared. He was also early interested in electrical interlocking between block instruments and levers and devised a method of applying it to his instruments in use on the Metropolitan and Great Western. A fire alarm system and other inventions were also due to him. A year or two after work began on the City of London & South-western Subway (later called City & South London Railway), the Jubilee of which was commemorated in the *Electric Traction* Section of our issue of December 13, 1940 (page 615), Spagnoletti

was called in as consultant, at first on signalling matters, and, when proposals for working by electricity instead of cable came before the board of directors, he was asked to assist in considering them, the directors announcing that it was on his advice that the scheme finally selected was chosen. This evoked some mild criticism in the technical press of the day, on the ground that his practical experience had been confined to telegraphic work. For this line he specially designed a modification of his lock-and-block apparatus, operated over two line wires and return. This proved satisfactory and was later adopted for the Central London Railway, remaining in use on both lines until modern track circuit signalling was put in, but no other railway was ever fitted with it.

With the support of the eminent telegraph engineer, Sir Charles Bright, Spagnoletti became in 1872 a member of the Society of Telegraph Engineers—the Institution of Electrical Engineers from January, 1889—and was elected to the council in 1874. In 1884 he was made a Vice-President and became President in 1885. His inaugural address dealt with the various developments in

electrical science and industry experienced during his lifetime. He never read a paper before that institution but was a frequent speaker in discussions there. He inherited the musical gifts of his family, composed several songs and wrote the words to the music of other composers. When Sir William Preece, Engineer to the Post Office, exhibited the first Edison phonograph seen in this country in February, 1878, at the Institution of Electrical Engineers, Spagnoletti sang a song and then "God Save the Queen," which were duly recorded; Preece suggested that the records should be played again in 100 years' time, but whether the cylinders are still in safe keeping, and if so, with whom, ready to surprise hearers in 1978, we are not aware. One of Spagnoletti's daughters married a son of the eminent physicist, Sir William Crookes, and a son, J. E. Spagnoletti, who died on October 2, entered into partnership with another son of Sir William Crookes and established an electrical engineering business in London, where the signalling apparatus for the Central London and the Great Northern & City Railways was constructed. C. E. Spagnoletti died at Hampstead on June 28, 1915, aged nearly 83.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

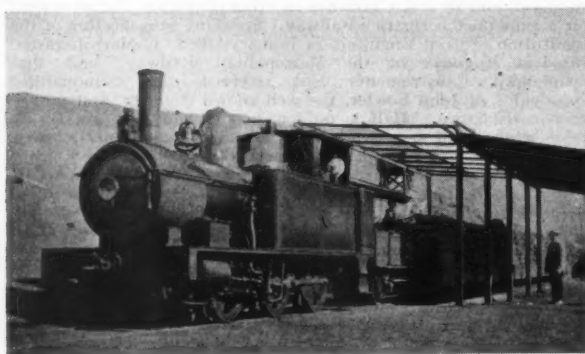
Long Life of British Locomotives

Taltal Railway,
Taltal, Chile

June 25

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of April 17 there is a photograph of a 0-6-0 locomotive, constructed by the Vulcan Foundry, and supplied to the Konstantinopski Railway in the year 1871. No mention, however, is made as to whether this locomotive is still on active service. Undoubtedly you will be interested in the enclosed photograph. From a casual glance at the locomotive you will immediately notice from its beautifully polished brass domes and bell that it is a much more modern 0-6-0 type. As a matter of fact, with six others, it arrived in Taltal during the construction days in the year 1881, and all of them are still in first-class condition and good for many more years of active as well as useful service. This class of tank locomotive, six of which were converted to oil burners, is the ideal and most suited for port traffic operations,



but it is seldom necessary to bring out more than one each day. In the illustration the iron box wagon, next to the engine, is used for the storage and delivery of links, as on this railway the rolling stock is fitted with centre buffer and pin attached, the link being loose. The photograph shows a convoy of sacked nitrate being weighed for shipment.

Particulars of the locomotive are as follow:—

Builder	...	...	...	Nasmyth Wilson & Co., Bridgewater Foundry, nr. Manchester
Year	...	...	...	1881
Cost	...	...	...	£1,200
Freight	...	...	...	120
Insurance and commission	...	...	...	30
Duty and landing	...	...	...	50
Erected Taltal	...	...	...	£1,400

Sixty-one years of useful service is a glowing tribute to the builders and, of course, at the same time, to our locomotive department for their care and maintenance, who report that maintenance costs have always been low.

We also have several Vulcan Foundry locomotives, but as these are mere youngsters, built in 1890, they are relegated to more

arduous duties, namely, main-line service, and thus in their particular sphere of operations contribute equally as well to the war effort.

Yours sincerely,
T. C. THOMPSON
General Manager

Mr. Urie's Engines

London, W.1

September 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—That part of the letter of your correspondent, Mr. Henry Maxwell, which condemns the engines for which the late Mr. R. W. Urie was responsible as "unsightly" calls, I think, for criticism in its turn. Mr. Urie's designs did not perhaps follow what may be termed the most graceful lines but to the eye of the trained locomotive engineer they possessed that somewhat indefinable quality that may best be termed "mechanical beauty" and combined an all-round not displeasing appearance with a satisfying sense of utility for their purpose. Locomotives, after all, are pieces of machinery and the practised onlooker keeps that instinctively in mind when taking in the lines of a design.

I would be the last to suggest that symmetry of outline in a locomotive can only be obtained by sacrificing accessibility and good mechanical qualities, but on the other hand I submit that because an engine is not all that neatness and symmetry decree it must not be labelled unsightly and as lacking in those qualities by which locomotives are sometimes judged and which centres in what we may call good looks.

In these matters it is possible to pay too much regard to the *tout ensemble* thereby overlooking details which on closer and/or more competent inspection, call forth admiration and denote the skill of the designer.

Yours faithfully,
CHAS. S. LAKE,
M.I.MECH.E., M.I.LOCO.E.

Train Services in 1880

United University Club,
Pall Mall East, S.W.1
September 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I send herewith for your inspection my copy of *Bradshaw* for July, 1880, the nearest date to Mr. Courtauld's period of "60 years ago" which I possess. The St. Pancras—Mansion House service is shown on p. 210.

There are two items of interest in the Midland Scotch service of July, 1880. (A) On the Waverley line trains were then running in both directions between Carlisle and Edinburgh in 2 hr. 20 min. (see p. 288). This timing in fact began in 1877; sixty-two years later, in the summer of 1939, the fastest timing between Carlisle and Edinburgh by the Waverley route was, northbound, 2 hr. 27 min., and, southbound, 2 hr. 26 min. Mr. Courtauld merely accused the railways of lack of progress; here is a case of actual retrogression.

On Saturdays only the summer timetable of 1939 gave one train from Carlisle to Edinburgh in 2 hr. 19 min., but there was no corresponding up train from Edinburgh. I should be surprised if any other important main line in the world had its best trains slower in 1939 than in 1877; certainly I do not know of any such case myself.

(B) In 1880, ten years before the opening of the Forth Bridge, Pullman sleeping cars were running between St. Pancras and

Perth; the excess charge above ordinary first class fare was apparently 8s. Today, although the distance from Perth to Euston is 23 miles less, and the ordinary first class fare is very much higher, the sleeping car supplement is—not 8s.—but £1 4s. 6d.; and the car in which I returned to London last month did not provide soap, hot water, or a glass for the toilet water.

I remember travelling by Pullman sleeper from Carlisle to St. Pancras in 1879, but generally it suited us better to use the day trains and I did not know much about the sleepers of 60 years ago. But at any rate they gave passengers more for their money than sleeping cars do at the present time.

Yours faithfully,
W. B. THOMPSON

[The section in *Bradshaw* for July, 1880, dealing with the St. Pancras-Mansion House service is reproduced on page 366—Ed. R.G.]

Locomotive Naming Ceremonies

14, Highfields Road,
Huddersfield

October 5

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—May I take the opportunity of agreeing most heartily with Mr. Richards in his sentiments that the naming of a class of locomotives is a suitable compliment to our gallant seamen who, as he points out, are giving their all and keeping open our lifelines of existence. It only remains to enquire whether an equal service is being rendered to the community in speech making, and in naming ceremonies attended by numbers of railway executives (with perhaps a rail tour included), at times when the railways are working to capacity and asking us if our journeys are really necessary.

It is beyond comprehension how Mr. Richards can describe the construction of Pacific locomotives in 1942 as a magnificent and noble enterprise worthy of many christening ceremonies. Perhaps the fact that these locomotives have developed from a myth in 1937 into a locomotive in 1942 gives some indication of the reason for these self-congratulatory gatherings.

Yours faithfully,
R. HOWARD

First Class Travel

London, S.W.1

September 8

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—As doubtless you are aware there has been recently a recrudescence in the daily papers of reports that the issue of first class tickets was to be discontinued. The last statement on the subject was to the effect that the Ministry of War Transport had "advised" or "instructed" the railway companies to withdraw first class accommodation on the trains not only for the duration of the war, but permanently; the following day's issue contained

a denial of the report, and the denial bore the imprint of an official pronouncement emanating from the Ministry.

It was urged in the earlier statement that the position had become anomalous, as the possession of a first class ticket did not in any case ensure to the holder a seat in the "first" or, indeed, a seat of any kind, and from this it was deduced that all trains should henceforth be of one class only, presumably third. My own observations as a daily traveller on a main line have made it clear to me that the trouble concerning first class seating accommodation on the long-distance trains so far as civilian passengers are concerned arises from the fact that practically the whole of it is taken up by members of the three Services and that in the majority of cases this personnel consists of very junior officers of both sexes, who, as is obvious, would for the most part, be travelling third but for the war.

When, as not infrequently happens, something like 65 to 70 per cent. of the first class seats are occupied by such travellers, with a sprinkling of senior officers, the civilian passenger's chances of getting a seat tend to be somewhat remote and a corner seat becomes almost a luxury. It should further be remembered that many of these civilian passengers are engaged on essential work and that numerous others are making the journey as part of business routine. Does it not seem reasonable that first class travel on the railways should not be made available to those below a certain officer rank, say, that of an army captain or its equivalent, except, of course, where an individual of lower rank likes to pay the extra cost out of his or her own pocket.

Yours truly,
CHAS. S. LAKE

Masking Colour Light Signals in U.S.A.

Signal & Telegraph Engineer's Dept.,
L.M.S.R. Headquarters,
Watford, Herts.

October 7

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Referring to the illustration and particulars published in your issue of October 2 based on a description in a recent issue of *Railway Signalling*, as this arrangement is quite different from British practice, in which dimming is universally adopted, I think it should be pointed out that in the early stages masking was considered but turned down for the following reasons:—

- (a) The baffle plates will facilitate the building up and adherence of drifting snow entirely blocking the light.
- (b) At night the full intensity of a colour light signal is brilliantly reflected from enamelled advertisement signs, the sides of coaches and engine steam and under certain circumstances would be visible to low flying aircraft moving parallel with a railway.
- (c) Strong public outcry against the retention of brilliant signal lights at night in the vicinity of cities and towns.

Yours faithfully,
A. F. BOUND,
Signal & Telegraph Engineer

Publications Received

Cutanit.—For the information of those who are not acquainted with the material known as Cutanit and its properties, the handbook recently issued by the manufacturers, William Jessop & Sons Ltd., and J. J. Saville & Co. Ltd., of Sheffield, will serve a most useful purpose; indeed, it should be of great value to those who already know and use the product. Either of the manufacturers mentioned will be pleased to send a copy of the handbook to those who apply for it. Cutanit is not a steel, but a cemented carbide which cannot be hardened or softened by any treatment; it cannot be formed by filing, forging, turning, milling, or planing, but can be shaped only by grinding with special wheels or by grinding or cutting with diamond wheels. The resistance of the material to shock is lower than that of steel and its properties remain unchanged up to temperatures of about 900°C. It has a hardness approaching that of diamonds and is used almost entirely in the form of tips brazed to steel shanks. Results depend very much on choosing the right grade of Cutanit and using it on the right machine tool. Also the proper speeds and

depths of cut vary in machining different materials, or, to put it in the words of the handbook, "Cutanit carbides combine a very hard degree of hardness with a very high degree of strength, and the relation between these two physical properties varies in different grades of Cutanit in order to adapt them to the operation for which they are intended." When all the correct conditions are adhered to, some remarkable results are obtained. The handbook, a new guide to machinist, provides a fund of general information as to how Cutanit is made and how it should be used. The book has a thumb index as well as a full subject index, and is copiously illustrated with blue prints and half-tone reproductions. Tables headed "Hardness Conversion" and "Conversion of Cutting Speed" are included, and there is a good deal of classified data regarding tool and tip dimensions and prices. Attached to the back cover is the very useful and ingenious Cutanit Calculator from which the correct working conditions for machining various materials can be ascertained automatically. Two complementary discs are arranged to rotate under two sets of "windows." By setting the two discs to show the material to be machined in the upper "window,"

the user can read off both recommended grade of Cutanit, feed, speed, etc., and the recommended cutting angle.

Machine Tool Control Mutual Aid Scheme.—With this as its title, the Machine Tool Control of the Ministry of Supply has issued two booklets; one contains the complete regional organisation information in connection with the use of small tools, and the other giving details as to how this may be applied to any one particular region. The information contained in these booklets is of great interest to machine tool and small tool users at the present moment. The survey which preceded the formulation of the scheme and subsequent preparation of the booklets had two main objects: (1) Obtaining information on the general causes of shortage or surplus of tools in any region, from which observed tendencies, and future production of tools could be planned and co-ordinated; (2) Satisfaction of the most urgent demands and the relief of bottlenecks in production. We have before commented upon the excellent and thorough manner in which the publications issued by Machine Tool Control are sent out and these latest ones are no exception to the rule.

The Scrap Heap

U.S.A. TRAVEL RATIONS

The United States Director of Defence Transportation, Mr. Joseph B. Eastman, said recently: "There is too much pleasure travel. If it is not stopped the Government may be forced to prevent it through rationing."

Two schools to fit young college women for the duties of ticket sellers and train information and reservation bureau attendants have been opened by the Pennsylvania Railroad in Pennsylvania Station—30th Street, Philadelphia. A third will shortly be started in Pennsylvania Station, New York City.

15 MILES OF SCRAP FOR MUNITIONS

Fifteen miles of disused narrow-gauge railway line running along the coastline in a West Country district are to be scrapped for munitions. Women volunteers will do most of the work which will take many months. The line is expected to yield 1,600 tons of scrap.—From the "News Chronicle."

Sometimes we are apt to think of our line as being mainly dependent upon the steel and coal mining industries, but 44 per cent. of the grain and flour carried by the four main-line railways originates at our stations, and no less than 70 per cent. of the vegetables. We also forward more than half of the packed manure, and about one-third of the whole of the livestock passing by rail. So good luck to the farmers and the land workers in their efforts to raise bumper harvests.—Editor's Note in the October issue of the "London & North Eastern Railway Magazine."

ST. PANCRAS TO MANSION HOUSE.—MID.

St. Pancras dep.	231	10	27	10	55	10	55	40
Camden Road	298	10	54	10	55	11	14	10
Kentish Town	318	10	56	11	11	10	14	10
Haverstock Hill	341	10	58	11	11	10	14	10
Finchley Road	351	10	59	11	11	10	14	10
West End	361	10	59	11	11	10	14	10
Child's Hill	371	10	59	11	11	10	14	10
Pudding Hill	381	10	59	11	11	10	14	10
Harrow Road	391	10	59	11	11	10	14	10
Acton	401	10	59	11	11	10	14	10
South Acton	411	10	59	11	11	10	14	10
Tottenham Green	421	10	59	11	11	10	14	10
Gunnersbury	431	10	59	11	11	10	14	10
Richmond	441	10	59	11	11	10	14	10
Shaftesbury Rd.	451	10	59	11	11	10	14	10
Hammermith	461	10	59	11	11	10	14	10
West Kensington	471	10	59	11	11	10	14	10
Earl's Court	481	10	59	11	11	10	14	10
Brompton	491	10	59	11	11	10	14	10
South Kensington	501	10	59	11	11	10	14	10
Sloane Square	511	10	59	11	11	10	14	10
Victoria District	521	10	59	11	11	10	14	10
St. James's Park	531	10	59	11	11	10	14	10
Westminster	541	10	59	11	11	10	14	10
Charing Cross	551	10	59	11	11	10	14	10
Temple	561	10	59	11	11	10	14	10
Blackfriars	571	10	59	11	11	10	14	10
Mansion House	581	10	59	11	11	10	14	10
Blackfriars	591	10	59	11	11	10	14	10
Temple	601	10	59	11	11	10	14	10
Charing Cross	611	10	59	11	11	10	14	10
Westminster	621	10	59	11	11	10	14	10
St. James's Park	631	10	59	11	11	10	14	10
Victoria District	641	10	59	11	11	10	14	10
Sloane Square	651	10	59	11	11	10	14	10
South Kensington	661	10	59	11	11	10	14	10
Brompton	671	10	59	11	11	10	14	10
Earl's Court	681	10	59	11	11	10	14	10
West Kensington	691	10	59	11	11	10	14	10
Hammermith	701	10	59	11	11	10	14	10
Shaftesbury Rd.	711	10	59	11	11	10	14	10
Richmond	721	10	59	11	11	10	14	10
Gunnersbury	731	10	59	11	11	10	14	10
Tottenham Green	741	10	59	11	11	10	14	10
South Acton	751	10	59	11	11	10	14	10
Acton	761	10	59	11	11	10	14	10
Harrow Road	771	10	59	11	11	10	14	10
Pudding Hill	781	10	59	11	11	10	14	10
Child's Hill	791	10	59	11	11	10	14	10
West End	801	10	59	11	11	10	14	10
Finchley Road	811	10	59	11	11	10	14	10
Haverstock Hill	821	10	59	11	11	10	14	10
Kentish Town	831	10	59	11	11	10	14	10
Camden Road	841	10	59	11	11	10	14	10
St. Pancras arr.	851	10	59	11	11	10	14	10

The St. Pancras to Mansion House service of the Midland Railway as shown in "Bradshaw,"

July, 1880

(See letter on page 364)



"Inverness next stop, Lady."

[Reproduced by permission of the proprietors of "Punch"]

Underground officials often supplement, in less-poetic language, the advice offered by Mr. Brown of London Town:—

"So let's all move along, says Billy, To crowd the entrance up is silly."

"A Rush-Hour Traveller" writes in answer:—

"The entrance may be crowded
But if you pass along
You will find yourself surrounded
By an even greater throng.
And furthermore, O Billy!
If you step on people's feet
Your reception will be chilly,
Though of shame you'll feel the heat.

And again when at your station
You endeavour to alight,
Unless you really hasten
And don't try to be polite,

You will pass your destination
Or, what is worse, because
You show procrastination,
You'll be caught between the doors."

J. R. W.

RAILWAY GOODS MAKE VANS

The standard of comfort on the Southern Railway luggage vans received an unexpected tribute recently when one of the 25-ton four-wheel vans came back to the works for repairs and was seen to have this inscription inside: "Well done, the Southern—the best brake van." The staff received this pat on the back with appreciation. The vans are illustrated and described on page 373 of this issue.

A correspondent writes that a recent item in this column, in which it was shown that L.M.S.R. allotments already under cultivation if placed end to end would equal a 30 ft. wide track from London to Dumfries, a distance of 332 miles, reminds him of an early American humorous book, which he thinks was called "Elbow Room," by Max Adeler. In it he recounted the experience of an American county which, finding its canal system put out of action by the newly-made railway, advertised for suggestions as to what use could be made of the derelict waterways and their barges. One suggestion was to the effect that the canals should be drained, and a pair of rails laid on the bottom. Large open tank cars were to be built to run on the rails, and filled with water. In these, the barges were to be floated, and the whole pulled by a locomotive. The great point made by the inventor of this plan was that as the tow-paths would no longer be required, they could be cut up into lengths, laid side

by side, and sold for a farm, the crops from which would provide a continual load for the barges.

FIRST AND THIRDS

I return, once more, to the difficult problem of vacant first class seats on long-distance trains. Plenty of railway servants and practically the entire travelling public are still unaware of the position now ruling. In brief it is this: If a train's third class seats are all occupied, a traveller with a third class ticket may occupy a vacant first class seat only by permission of a stationmaster, an inspector, or a guard. That is not what has been understood, as I have found on inquiry, by even M.P.s and some Ministry of War Transport officials, let alone the public. But it is the rule now. I am told so by responsible officers of the railway companies, and the rule is confirmed by the Public Relations Officer of the Ministry. I asked this officer what a passenger should do who could find neither a third class seat, nor an inspector, nor a guard, and saw a vacant "first." Could he take it?

"The rule is that he can do so only with the permission of the company's official," he said. "The inspector would ask him to pay the excess fare."

"Suppose he declines to pay?" I asked. "The proper thing for him to do would be to ask the inspector to find him a seat elsewhere on the train. If one cannot be found, the traveller would be justified in staying where he was, and declining to pay—unless there was a first class passenger waiting for the seat."—From the "Star."

Moncton, New Brunswick, is puzzled at the moment over the question of salvaging the old street car line, which was buried 11 years ago under a mile and a half of pavement. The Federal Government has ordered the reclamation of the line, but the City Fathers question if the expense of salvaging it will make the project worth while.—From "Canada's Weekly."

TAILPIECE

The railways report that their embankment harvest is beating last year's records.

Mary, Mary, quite contrary,

Where does your garden grow?

It grows in a pen just thirty by ten,

And the branch line runs below.

I hoe, trench, harrow, and push my barrow,

Along the embankment top.

My runners and creepers have straddled the sleepers,

And the trains will have to stop.

E. C.

OVERSEAS RAILWAY AFFAIRS

(From our own correspondents)

CANADA

C.N.R. Locomotive Mileage

Mr. J. Roberts, Chief of Motive Power & Car Equipment, Canadian National Railways, stated recently that a survey of the mileages travelled by C.N.R. locomotives operating passenger services had shown that, during the month of July, 34 locomotives covered a total distance of 422,809 miles, or an average of more than 12,430 miles each. Of those 34 locomotives, that which had covered the greatest distance had a mileage of 16,340 during the month in question; the minimum mileage attained had been 10,000. The group included locomotives of the "5700," "6000," "6100" and "6400" classes. Mr. Roberts added that such locomotive performance was an important factor in meeting the heavy passenger demands at present being made.

UNITED STATES

Floods in New York City

On the morning of July 27 heavy rainstorms on the northern outskirts of New York City caused interruption of train services, particularly on the main line of the New York, New Haven & Hartford Railroad, and the Harlem Division of the New York Central System, both of which use the same electrified lines from the northern edge of the city into the Grand Central Terminal. Third-rail electrification is in use, and, due to flooding of the line at various points, it became necessary to cut off the current at 7.30 a.m. Some 50 New Haven trains were held up; the majority were suburban business services, but through expresses between Boston and New York also were affected, although the latter position was eased by running extra trains to and from the Pennsylvania Station by the Hell Gate Bridge route. The N.Y.C. interruption was entirely to suburban trains, as the long-distance trains use another line. Full service was resumed at noon. Washouts occurred on several branch lines outside New York.

Signalling Contracts

An order has been placed by the Louisville & Nashville Railroad with the General Railway Signal Company for the equipment to instal centralised traffic control between Winchester and Irvine, Kentucky, a distance of 23½ miles of single track. The control machine is to be located at Ravenna, and c.t.c. on the two-wire coded principle will be used. Other recent signalling contracts placed with the same company are for intermittent inductive auto-manual train-control apparatus for installation on 25 steam locomotives now in course of construction by the Lima Locomotive Works for the New York Central System, and four similar items* of equipment for diesel-electric locomotives now building for the Southern Railway.

A Nickel Plate Yard Improvement

Improvements on a considerable scale are being made by the New York, Chicago & St. Louis Railroad (generally known as the "Nickel Plate" line) to its freight yard at Conneaut, Ohio, 115 miles west of Buffalo. Previously this was a storage yard only, but nine terminal roads now are being extended to a new switching lead at the west end of the yard, and, by improvement

of the east-end switching lead, the layout will be transformed into a through marshalling yard, with accommodation for 1,747 freight wagons in place of the previous 1,214. The running tracks also are being relocated to provide increased flexibility of operation.

Minneapolis & St. Louis Railroad Reorganisation

The Minneapolis & St. Louis Railroad, which has been in low water financially since July 26, 1923, when it went into receivership, and has been since the subject of 43 successive attempts at sale, now is being reorganised, as a result of a successful bid of \$2,010,000 by the reorganisation managers at an auction sale of the property and assets of the line, held in Minneapolis on July 24 last. This bid reached the minimum price which had been fixed by the Federal court, and the reorganisation has been approved by the Interstate Commerce Commission, the Reconstruction Finance Corporation, and the majority of the stockholders and preferred creditors. The plan contemplates that the M. & St. L. system, which covers a total of 1,500 miles, shall be operated by two new companies, one, the Minneapolis & St. Louis Railway, to take over the lines east and south of Minneapolis, and the other, known as the Minneapolis & St. Louis Railroad, to operate the lines west of Minneapolis, and the line from Winthrop, Minn., to Fort Dodge, Iowa. The objections of minority bond-holders have yet to be heard, but are not expected to hold up the scheme.

A Record July 4 Traffic

A record-breaking passenger traffic was expected by all American railways to materialise at the July 4 week-end, and this forecast was realised. Despite the shortage of rolling stock and staff and the general congestion caused by war conditions, the companies once again rose to the occasion with complete success. All available locomotives and coaches were pressed into service, and even the luggage spaces of combined brake-coaches were fitted with temporary seating accommodation; multiple-unit electric stock was worked by steam locomotives to and from the Atlantic coast resorts popular with New York and Philadelphia residents, and dining cars were loaned freely by one company to another as required. On many runs all Pullman space was sold out completely long before the week-end in question. No special excursions were run from the eastern cities, and the summer-camp movement at this season, although carried out as usual, was dealt with without Pullman facilities and, as far as possible, was got out of the way by July 1. The general passenger movement began about a week before the Fourth, and, although trains were very crowded, it is believed that all passengers desiring to travel were accommodated.

SWEDEN

Lifting a Train Ferry

Efforts are being made to lift the Swedish train-ferry *Starke*, owned by the Swedish State Railways, which sank when plying its ordinary route between Trelleborg and Sassnitz last February, as the result of a mine explosion; the vessel was holed in the stern. The work of lifting the ferry, which weighs 4,000 tonnes, has been entrusted by the Swedish State Railways

to a German salvage concern and the most powerful lifting pontoons available are said to be employed. The vessel lies at a depth of 92 ft. The cost of salvage will be borne jointly by the Swedish State Railways and the Reichsbahn. It is expected that, once the vessel has been lifted, it will take from seven to eight months to put it into working condition. The *Starke* is of the so-called ice-breaking type and so has proved invaluable in maintaining the winter traffic between Sweden and Germany; it is the only vessel of that type owned by the Swedish State Railways and has a carrying capacity of 25 loaded wagons, as compared with the 15 wagons each which the other two Swedish train ferries on that route (*Konung Gustaf V* and *Drottning Victoria*) are able to handle. In an endeavour to save the ship when it was mined, six of the 23 railway wagons then on board were jettisoned, but to no avail. The *Starke* seems to have been a particularly unlucky vessel. When it was built at Kiel in 1930, the construction met with widespread criticism, and, when undergoing trials in 1931, the engine broke down; on a later occasion, on a trial run off Trelleborg, it nearly capsized in a storm. It cost about Kr. 3,500,000, but is valued at Kr. 5,000,000 at the present time. The loss of the *Starke* was the third mishap on the Trelleborg-Sassnitz route. The first concerned the old mail steamer *Rex* (before the introduction of the ferry service) which became a total loss off Sassnitz in 1909; and the second involved the German train-ferry *Preussen* which grounded off Stubbenkammer in 1938. In spite of the general view that it would be lost this ship was salvaged and is in service again.

SLOVAKIA

Diesel-Electric Express Service

The Slovak State Railways introduced on July 4 a limited express service between Bratislava and Poprad-Tatry (on the Žilina-Kosice main line), a distance of about 340 km. (210 miles), using a diesel-electric railcar, which makes one trip (in 4 hr. 40 min.), each way a day. It is about 75 ft. long and has first and second class accommodation only; there are 64 fixed, and six tipping, seats, a luggage compartment with capacity of 2 tons, and storage space under the body for 150 pairs of skis. This vehicle, called the Tatra Express, has a diesel motor of 240 h.p., and carries oil supplies sufficient for a run of 1,000 km.; its normal speed is 85 km.p.h. (53 m.p.h.), and the maximum is 110 km.p.h. (68 m.p.h.).

Railway Electrification

Although the plans for electrification, as reported in THE RAILWAY GAZETTE of May 29 (page 611), are now ready as far as the main-line section from Žilina to Spis Nova Ves, 166 km. (103 miles) of double track with gradients of up to 1 in 60, and the branch line from Poprad-Tatry to Tatranska Lomnica, 9 km. (5½ miles) of single track are concerned, it is stated that work will not begin until materials can be procured; it is expected to be completed within 3 years of commencement. Besides the extension of electrification from each end of this section to the respective frontiers, further sections for which plans are now in preparation are the main line from Vrútky, via Zvolen, to the Hungarian frontier, a line with severe gradients (many of 1 in 50), the main line from Zvolen to Margecany (via Banská Bystrica), the branch line from Brezno to Tisovec (including the rack section near Polhora), and the Bratislava-Kuty section (the Slovak portion of the main line to Brno).

Electric Locomotives for Industry

Some recent examples manufactured by the English Electric Co. Ltd.

THAT operational and economic advantages are possessed by electric locomotives in many types of industrial work is suggested by their increasing use. A general-utility type for standard-gauge lines is the two-axle locomotive with a central cab, and a number of these have been built recently by the English Electric Co. Ltd. This type of locomotive is suit-

battery locomotive for Swindon Corporation. Fig. 4 shows an industrial locomotive for operation from an overhead contact wire only, supplied to the Fairfield Shipbuilding & Engineering Co. Ltd.

All these locomotives are equipped with two standard-type traction motors, driving through single-reduction gear, one to each axle. Control is effected from the hand-

The brake blocks are of cast iron, one block to each wheel. In addition, the controller is arranged to provide electric rheostatic braking, which is very useful in cases where the locomotive must hold a heavy train when running down a grade.

On battery locomotives, the battery is housed in the two end compartments which are painted on the inside with acid-resisting paint, and are provided with ventilating louvres cut in the end plates. The covers are rain-proof and have cowled openings for ventilation of the compartment. A special method of mounting enables the

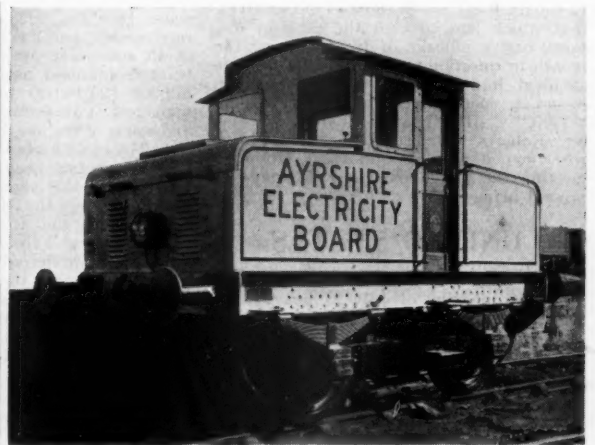
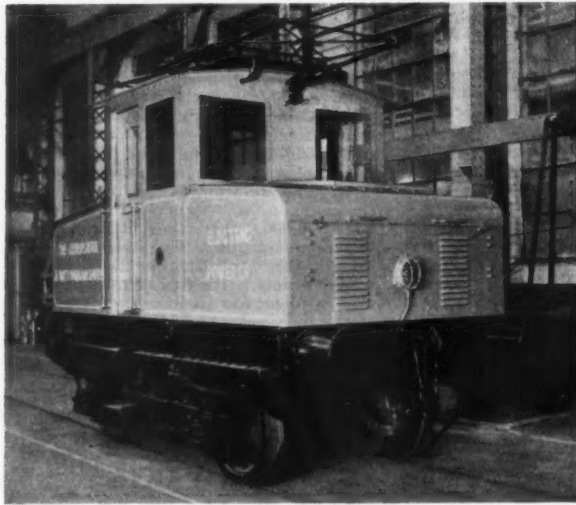


Fig. 1 (left)—A combined battery and trolley vehicle
Fig. 2 (above)—A battery locomotive

able for battery or for overhead-line operation, or for a combination of both; it can be built to individual requirements ranging in weight from 12 to 24 tons.

Fig. 1 shows a combined battery and trolley locomotive supplied to the Derbyshire & Nottinghamshire Electric Power Company through Balfour Beatty & Co. Ltd. This is the second locomotive of the type supplied to this power company. Fig. 2 illustrates a battery locomotive for the Ayrshire Electricity Board, and Fig. 3 a

operated drum-type controller in the central cab which provides series-parallel operation of the motors. The general characteristics of these locomotives are given below:—

	Derby & Notts E.P. Co.	Ayrshire	Swindon	Fairfield
Weight ...	20 tons	20 tons	14 tons	22 tons
Voltage (line) ...	300	250	200	500
Voltage (battery) ...	220	252	224	—
Battery capacity at 5 hr. rate in amp. hr. ...	294	54	31	150
H.p. ...	68	11,000 lb.	7,500 lb.	12,000 lb.
Max. t.e. ...	11,000 lb.	11,000 lb.	7,500 lb.	12,000 lb.

Mechanical brakes are fitted and are operated by a handwheel inside the cab.

covers to be swung over the end of the compartments to give a clear opening for inspection or removal of the battery.

The battery cells are mounted in crates

which in turn are wedged into position in
(Continued on page 371)

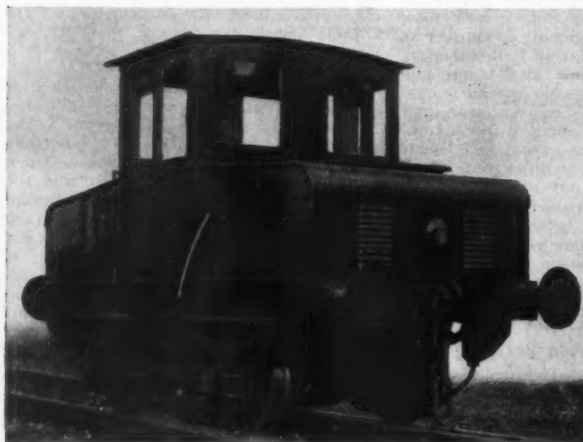


Fig. 3 (above)—A battery locomotive
Fig. 4 (right)—A vehicle operated by overhead contact wire

Experience with Individual Spring-Drive Mechanisms

Some details of the Meyfarth system

ALTHOUGH one of the earliest forms of axle drive for electric locomotives and motor coaches was the "direct" one, always said to have been proposed by Sir William Siemens, and in which the armature is mounted directly on the axle, it has been comparatively little-used on account of various practical difficulties, although it is an extremely simple form of construction. It was followed by the geared system using nose suspension, and later by side-rod drives for large electric locomotives, for which the ordinary geared tramway arrangement was not suitable. With the side-rod systems, much used in single- and three-phase working, large motors set somewhat high in the locomotive were able to drive a number of axles and the maximum adhesion was obtained. Nevertheless, the mechanical disadvantages of the rod systems led designers to seek to produce individual drives, for transmitting considerable power to a number of axles without the necessity of side rods. From this desire have emerged the various forms of quill drive and designs related thereto, provided with a certain elasticity between the quill and the axle driven by it; both spring and link mechanisms are used for this purpose.

Some details recently have been given in the house journal of the well-known Geneva firm of Sécheron concerning the

experience obtained with the cup-spring drive and the later spring-box drive, both developed by that company. The latter system is called the Meyfarth-Sécheron drive, and since 1935 it has been applied to 14 vehicles, both locomotives and motor coaches, involving 56 axles. The earlier spring drive has been applied since 1926 to 661 axles on 164 vehicles.

Simple Device

In the first arrangement the springs rest in cups at each end but are otherwise uncovered, so that in principle the device is very simple. It has been applied to wheels of widely-varying diameter, down to 975 mm. (3 ft. 2½ in.) on the Bernina Railway locomotives, and used for all forms of service. One of the objections often advanced to this form of drive is the liability to spring breakage. It is stated, however, that practical experience, supported by statistics based on the performance of more than half the vehicles fitted, shows that the risk has been exaggerated greatly. The 66 vehicles (244 axles) ran a total of 89,000,000 axle-km. (55,302,000 axle-miles) and 783 spring breakages were recorded, which means that a set of springs controlling a wheel would call on the average for a total replacement in the course of running 1,350,000 km. (839,000 miles). To achieve such results it is nevertheless essential to

ensure that the springs are not stressed beyond a certain limit. Their deformation is produced by the combined effects of tension and compression, the eccentricity between quill and axle, and the effects of centrifugal force. The latter render it unadvisable to use this form of construction for vehicles running at very high speeds. The critical speed is not a fixed figure, of course, but depends on the wheel diameter, the power to be transmitted, and the eccentricity admissible between quill and axle, but generally speaking the plain spring-cup drive can be regarded as satisfactory up to 100 km.p.h. (62 m.p.h.).

In more recent years many electric locomotives and motor coaches, especially of the railcar type, have been built for speeds of up to 130 km.p.h. (81 m.p.h.), and the centrifugal force set up tends to produce more frequent spring failures. To meet this arrangement the Meyfarth modification was introduced. The springs are in boxes and are subject only to tension or compression; the centrifugal effect is eliminated. A disadvantage of this plan, however, is that with ordinary plain sliding faces between the wheel and the driving portion of the mechanism there is a good deal of friction and wear; in the Meyfarth system this is avoided by using spherical heads on the spring-rod noses, so that a rolling, and not a sliding, action takes place. There are two principal forms of this type of drive, one of which is suitable for the larger wheels of locomotives and the other for motor-coach wheels.

Trolleybus Operation at 1,000 Volts D.C.

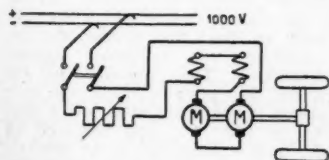
Successful results have attended the adoption of a pressure of 1,000 volts for a Swiss trolleybus service, and an increase to 1,500 volts is in contemplation

IN a review of the trolleybus services operating in Switzerland in our Road Transport Section for January 23, 1942 (page 129), reference was made to the adoption by the Rhine Valley Tramways of the unusual voltage of 1,000 d.c. for its Altstätten — Heerbrugg — Berneck route, in the Canton of St. Gallen, opened on September 24, 1940. Further technical

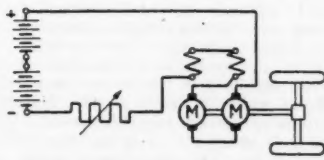
11 km. (6.8 miles) contact line was fed from two points only, and existing substations could be used with a minimum voltage drop. A higher voltage enables a smaller contact wire to be employed, and as twice the length is needed compared with a tramway which can use the track for one pole, an appreciable saving in copper is effected—an important con-

light design, seating 30 persons, with a parcels compartment. Drive is by two 40 kW motors, the armatures of which are mounted on a common shaft, connected permanently in series. Series-parallel control was not thought advisable in view of the eventual increase in line voltage. The control apparatus is also simpler with this arrangement. Rheostatic braking is used, and the motorman drives by foot pedals, but the power pedal, instead of actuating the controller direct, governs a series of electro-pneumatic contactors providing 15 steps. Their operation is graduable in both directions.

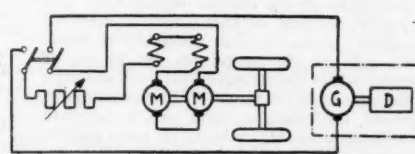
An accumulator battery is carried to



Normal trolley working



Emergency battery working



Special working with generator trailer

details of this interesting equipment have since become available.

Hitherto trolleybuses have usually been operated at the so-called tramway voltage of 500-600 volts, although pressures up to 750 volts have been used in some cases. To use 1,000 volts called for some additional precautions in insulating at points and crossings, where wires of opposite polarity necessarily cross, but was determined on for this installation as the

sideration when the replacement of trams by trolleybuses is contemplated. It is proposed eventually to raise the voltage on the Berneck line to 1,500, the equipment being already made to suit.

There are five vehicles, of which the bodies were provided by the Société Industrielle, Neuhausen, the chassis by F. Brozincevic, Wetzikon, and the electrical equipment by Sécheron, Geneva. The bodies are all-steel, welded, of specially

enable the vehicle to move a short distance, in case of emergency, away from the route, and provision is also made for running from energy supplied by a diesel engine and generator carried on a trailer vehicle. It is proposed to operate regular services for certain distances off the main route in this manner, where traffic is light. The accompanying simple diagrams show the electrical connections required for the three modes of working.

Recent American Steel Rail Developments

New standard practice is recommended for controlled cooling and for the classification of rail defects: further research has been made into the transverse fissure defect, and into failures of hardened rail-ends

SOME important changes in standard American steel rail practice are likely to be made shortly if, as is probable, the findings of certain rail committees are adopted. Committee 4 of the American Railway Engineering Association, which is concerned exclusively with rails, recommends that the taking of impression tests on rail-heads, with a hardened steel ball of 19 mm. dia. under an applied load of 100,000 lb., be abandoned. This test has hitherto been made for information purposes only, and not as a ground of acceptance or rejection, and it is felt that it is not of sufficient value to justify continuance, as the hardness of the rails can be deduced with reasonable accuracy from the other physical tests. In Great Britain the impression test is normally applied only to rails which have undergone the Sandberg sorbitic treatment and, for comparison purposes, to untreated rails from the same casts; here the information obtained is definitely of value, as it measures the surface hardness of the treated rails, whereas the tensile test is prepared from an area of the steel of which the centre is $\frac{3}{8}$ in. below the running surface, and thus does not indicate the full surface hardness.

Controlled Cooling

The Joint Committee for the Investigation of Fissures in Railway Rails, conducted by the Engineering Experiment Station of the University of Illinois in co-operation with the Association of American Railroads and the Rail Manufacturers Technical Committee, recommends a standard practice for the controlled cooling of rails. In the United States and Canada cooling is carried out in boxes or containers, and is a more prolonged operation than is customary with the fixed or moving ovens on the rail cooling-banks that are the standard practice in Great Britain. The containers themselves are either insulated steel cars with covers, or sheet metal boxes with movable tops, and the rails in them do not all cool at the same rate. The temperature of those in the centre of the box falls more slowly than that of the first rails put in, at the bottom of the box, and also those at the outside of the box, and largely because of these varied rates of cooling, it was at first necessary to leave the rails in the containers for 15 hr. or more, while their temperature fell through the appropriate range. This tended to retard mill output, and so to increase production costs; indeed, in consequence of the time occupied in thermal treatment, it was nothing unusual for rails to appear in the finishing department from 24 to 30 hr. after they had been rolled.

Greater uniformity has now been secured, however, by suitable insulation of the boxes, and this has prompted the practice now recommended of the joint committee just referred to. It is, first, that all rails shall be normally cooled in air until the temperature has fallen to between 600 deg. and not less than 385 deg. C., and that they shall then be charged immediately into the containers. The charging temperature is to be ascertained by a reliable pyrometer applied to the top of the rail-head not less than

12 in. from the end. Directly charging is completed the cover is to be placed on the container, and left in position for at least 10 hr.; after the cover is lifted, no rail is to be removed from the container until the temperature of the top layer of rails has fallen to 150 deg. C. or less. The container shall be so insulated that from the time the bottom tier of rails has been loaded into it, at least 7 hr. shall elapse before the interior temperature falls to 150 deg. C. These temperatures are to be based on readings taken by pyrometer between an outside rail and the next adjacent rail in the bottom tier of the container, at a point not less than 12 in. nor more than 36 in. from the rail-end. All rails that have been subjected to controlled cooling are to be hot-stamped with the letters "CC," or, if end-hardening also has been applied, "CH." The chief change in practice so indicated relates to the position of the control thermo-couple or pyrometer in the container. Previously this was located in the centre of the pile of rails, and the minimum cooling time recommended was 15 hr. Experiments were in progress throughout last winter in the insulation of containers, and the elimination of free air space at the ends of the containers and underneath the bottom tier of rails, to ensure that this drastic change of method should achieve the result desired. The advantage to be secured, of course, is that of reducing the time spent in the controlled cooling, and so speeding up production without any sacrifice of safety.

Brunorizing

Another and more elaborate treatment now in the early stages of its application to American rails is known as Brunorizing. In this process the rails are allowed to cool after rolling in the normal way to about 480° C., and are then reheated in a furnace, under accurate and uniform temperature control, to a little over 800° C.—that is, above the critical temperature of the steel—and at this temperature they are held for a sufficient length of time to ensure uniformity of temperature throughout the rail section. After this treatment, they are removed to the hot bank and allowed to cool normally. Brunorizing has the advantage of improving the physical properties of the steel, as expressed in elongation and reduction of area in the tensile test (an improvement of particular value in view of the high combinations of carbon and manganese in American rail steel), as well as that of fissure elimination, but the plant required for the treatment makes it more costly than retarded cooling in containers.

Varieties of Fissuring

Although both the foregoing treatments appear to provide a complete cure for shatter-cracking, which is the principal cause of fissuring, neither is a protection against fissures of other types. Longitudinal fissures, which result in split webs and split heads, are a product of unsatisfactory melting-shop methods, and the defect is present in the ingot before rolling is begun. Inclusions of slag and other irregularities, which occur both in

casting and in rolling the steel, add their quota to the number of rails fracturing in service, but these defects in general give external evidence of their presence in ample time to permit of removal of the rail from the track before fracture takes place. There is, on the other hand, no external indication of the presence of a transverse fissure; yet the detector cars do their work with such thoroughness that the majority of the fissures detected are in size less than 30 per cent. of the cross-sectional area of the rail head. Nevertheless, it is a disquieting fact that from time to time the detectors fail to indicate the presence of much larger fissures which are on the point of breaking out to the surface of the rail; fortunately, however, these detection failures are of relatively rare occurrence. The most dangerous rails are those in which multiple fissures are in course of development, but a high proportion of the fissured rails contains a single fissure only. The progressive increase in the number of fissures detected in American tracks is due to the increase in the number of detector cars in service, the greater mileage of track tested, the improvements in the sensitivity of the detection apparatus, and the growing competence of the operators. The heavier punishment to which rails are being subjected by reason of heavier loads, greatly increased train speeds, and more frequent train services, also accelerates the development of fissures. As it will take twenty years at least before all the rails in the most important main lines have been replaced by those which have undergone retarded cooling many years must elapse before the rail fissure trouble can be expected to show any material diminution, though the present position is not regarded as giving any cause for alarm.

In 1939 a lengthy series of experiments was conducted at different mills with short lengths of rail, designed to settle as accurately as possible the correct temperature treatment to secure immunity from fissuring. As there is no certainty that any given steel will or will not fissure when the rails are cooled out normally, an ingenious method was devised for feeding hydrogen into the ingot-moulds in which the test ingots were cast, as hydrogen-treated steel may be relied on to develop shatter-cracking in normal air-cooling conditions. In these experiments, shatter-cracks were produced in rails cooled out in air when the temperature was falling between 200 and 150° C. But rails which were held for a sufficient length of time at a temperature above 200° did not develop any cracks; and the higher the temperature at which the rails were held, so much the shorter was the time necessary to safeguard against shatter-cracking. Thus, whereas 7 hr. was needed for this purpose when the rails were placed in the boxes at as low a temperature as 260° C., and removed at 170° C., if they were put in at 480° C. 4 hr. was sufficient, and if at 600° C. 3 hr. sufficed. It was also found that holding the rails at 480° C. in the cooling box did not appreciably lower the Brinell hardness; but holding them at 600° in boxes packed with rock wool insulation lowered the hardness by 5 to 10 Brinell numbers, while holding them in a furnace for 5 to 6 hr. at this temperature lowered the Brinell hardness by 25 to 30 points.

Classification of Rail Defects

New definitions have recently been laid down by the Rail Committee of the A.R.E.A. to assist in classifying the causes of rail failure from external scrutiny of

the fractures. They define a transverse fissure as a progressive crosswise fracture, starting from a crystalline centre or nucleus inside the head, and spreading outwards as a smooth, bright or dark, round or oval surface, substantially at right-angles to the length of the rail. The feature distinguishing the transverse fissure from other types of defect is this crystalline centre and the smooth surface of the development which surrounds it. A horizontal split head is defined as a horizontal defect originating inside the head, usually at a depth of $\frac{1}{4}$ in. or more below the running surface, which progresses horizontally in all directions, and is usually accompanied by a flat spot or depression on the running surface of the rail. This defect, when it reaches the side of the rail-head, appears as a longitudinal crack. The definition of a compound fissure is a fracture which originates in a horizontal split head, and then turns up or down in the head of the rail as a smooth, bright or dark surface, progressing until it is mainly at right-angles to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split from which they have spread. Detail fractures, in American practice, originate at or near the running surface of the rail, either from defects which have caused small shell-like pieces of steel to become detached from the rail, or from "head checks," where movement or flow of the metal in the head, usually on the running edge, has caused the development of hair-cracks. These detail fractures must not be confused with transverse or compound fissures, or other defects of which the origin is internal. Another type of failure

is the engine burn fracture, which originates at spots where driving wheels have slipped on the rail-head, causing the formation of hair-cracks or other surface defects which spread downwards progressively into the rail-head. In its development this defect may resemble the transverse or compound fissure, but must not be confused with it. In addition to the foregoing, of course, there are other readily identifiable causes of failure, such as piping, secondary piping or completely enclosed gas pockets, rolling overlaps, and so on.

Hardening Rail-Ends

To arrest, as far as possible, the battering of rail-ends under the extremely severe load, speed, and traffic conditions of many United States main lines, the practice has arisen of hardening rail-ends, either by flame-hardening or quench-hardening treatments. These were first applied *in situ*, but latterly the general method has been to harden the ends of the rails at the mill before delivery. In one test length on the main line of the Chesapeake & Ohio RR., in which 948 rail-joints, comprising nine distinct methods of end-hardening, have been under observation, it has been found that 151 of the 1,896 treated ends are in course of developing defects. The defect is a crack, starting horizontally in the centre of the head about $\frac{1}{4}$ in. below the running surface of the rail, and extending or creeping backwards, in annular fashion, at the same distance below the surface. The cracks appear to begin as corrosion fatigue cracks, and most of them originate at grooves left in the rail-end as a result of the action of grinding tools. Observa-

tion at intervals confirms the spreading of the cracks, and that the top surface of the rail is likely in time to break away, so that building up of the end by welding will ultimately become necessary. The cracked rails are confined mainly to those on which the end-hardening was carried to extremes, with the result that Brinell readings on the hardened surface were as high as 400 to 425. It is curious that in face of the warning given in America by the transverse fissure menace as to the risk that may attend the use of very high carbon contents in rail steels, such drastic rail-end hardening methods should have been adopted, and the results can hardly come as a surprise. The less drastic treatments, however, have given no trouble, and are regarded as satisfactory in the reduction of rail-end batter that they have made possible without risk. It is realised that end-hardening at the mill is another cause of delay in American rail production, but in such conditions the hardening can be effected with greater precision and less risk than in the track, and is also conducted on a new rail, instead of on a rail on which wear has already begun. Even when hardening proceeds on a three-shift basis at the mill, however, the operations tend to block loading platforms and delay shipments. It has been suggested that there would be economy in time and labour if rails intended to carry one-way traffic were hardened at one end only, seeing that it is only the lead-on end of a rail that suffers from batter conditions; but against this is the extra labour and trouble involved in getting the rails to the site with their hardened ends pointing in the right direction.

Signalling Progress in New South Wales

The development of munitions and other heavy war traffic has necessitated much new signalling work on the New South Wales Government Railways

THE Annual Report for 1940-1941 of the Railway Department of New South Wales shows that the staff of the Signal Engineer, Mr. W. F. Barton, was kept fully engaged throughout the twelve months and that the workshops output reached a high level. Improved telegraph facilities were provided between a number of principal stations and duplex working was installed between Sydney, Albury—the interchange point with the Victorian Railways—and Melbourne, to relieve the congestion which had arisen on that route. Additional automatic signalling sections were put in on various parts of the system, in some cases with the time relay approach control, used on the suburban lines, which allows of a train moving more closely up to another than the conventional arrangements. Many new sidings were brought into use in connection with industrial plants, including the Australian Iron & Steel Company. Further extensions have been made of the automatic system of working passing loops, which has proved so successful and was introduced in New South Wales many years ago. The arrangements are specially designed to avoid staffing such loops and to expedite train movements. In the case of through trains not requiring to enter these loops or make a crossing with another train, all that is necessary

is for the driver to bring his train to a stand at the signal box in which the electric staff instruments are located and for the fireman to insert the staff for the section over which the train has travelled and obtain, under the automatic working process, the staff for the section in advance. Home signals are provided a train's length out from the electric staff instrument box to ensure that the rear of a train has arrived inside signal protection before the staff for the section in rear is inserted in the instrument. The actual time of operation under this method, apart from the actual stopping and starting, does not exceed one minute. An electric releasing arrangement is provided in order that trains making a crossing can do so expeditiously; the entrance and exit of trains to and from the loop are also electrically controlled.

Fourteen simplified crossing loops were put in on the Broken Hill line, where a large increase of traffic was expected. Improved signalling was also provided at the Hawkesbury River bridge, to deal with the position arising from the work being done in connection with the new structure. Automatic electric staff working has been generally much extended and found to give satisfaction. The telephone train control system was again extended and also the trunk telephone

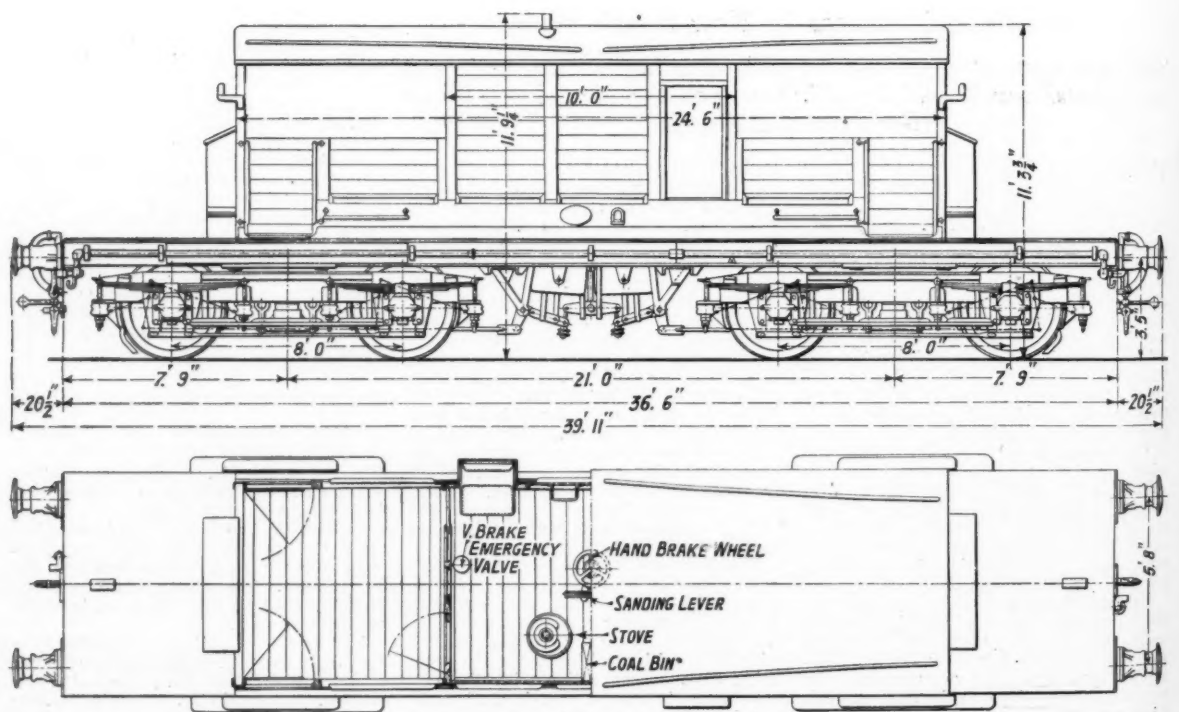
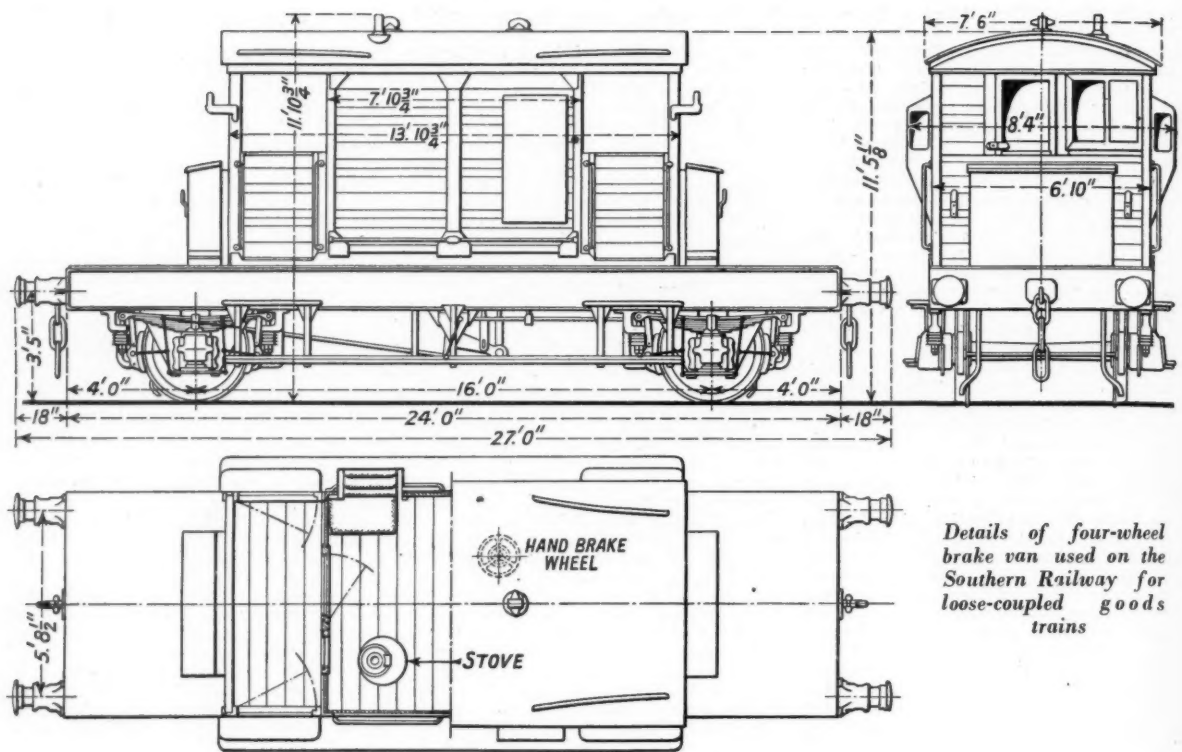
system in country districts. Telegraph poles made from old rails—of which 2,500 were so utilised—continued to replace the original wooden type. The department makes considerable use of the Edison-type storage battery, of which many hundreds were reconditioned at a special depot. Existing cables were specially examined and their coverings treated, and fibro-cement troughing replaced wooden.

The expenditure incurred on overhaul and maintenance work has been more than off-set by the results obtained, for notwithstanding the increase in traffic and the bringing into use of so much new work, with corresponding additional maintenance, the total number of signalling failures of all kinds did not exceed the remarkably low figure of 184, a most creditable achievement.

Electric Locomotives for Industry (Concluded from page 368)

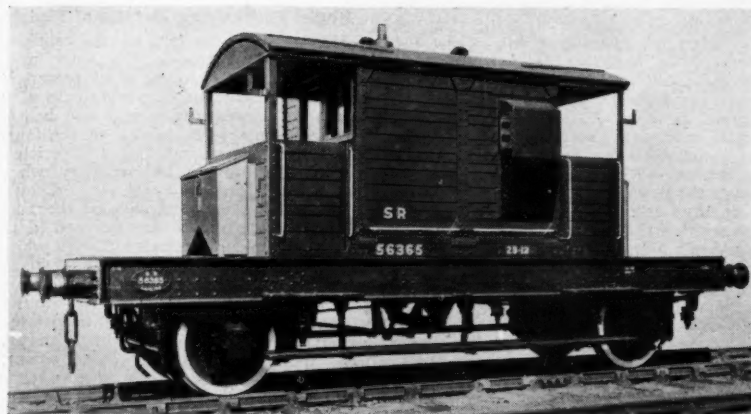
the compartments. For locomotives arranged to operate from an overhead contact wire, a variety of means for current collection are available. The illustrations show examples of pantograph and bow-type collector gear, but trolleys can also be provided. The latter method, with two trolleys, must be used when an insulated return is required.

The combined battery and trolley locomotive is arranged so that whilst standing under the overhead line, the battery is charged automatically. Plain battery locomotives are provided with sockets fitted on a switch-panel inside the cab to which the charging supply can be plugged by means of flexible cable.



Southern Railway Goods Brake Vans

Four-wheel and bogie vehicles for loose-coupled and vacuum-fitted trains



THE Southern Railway for some years has constructed four-wheel brake vans and eight-wheel bogie vans for use in operating its goods trains. Vans of the former type have a wheelbase of 16 ft., and a weight of either 15 or 25 tons, and are used for ordinary loose-coupled goods trains or partially fitted vacuum-brake goods trains. The vans are similar except as to the underframes and wheels which are designed to suit the respective weights. The bogie type is used for the fast goods trains, the stock of which is fitted with screw couplings and has either through vacuum pipes or complete vacuum-brake equipment.

The adoption for the heavier goods trains of vans having a weight on rail of 25 tons instead of the more usual weight of 20 tons is accounted for by the fact that the intensive and rapid service of electric trains in the inner and outer suburban electrified areas demands a higher standard of brake control for goods trains than would be provided if 20-ton vans were used. It may further be asked why the Southern Railway uses bogie goods

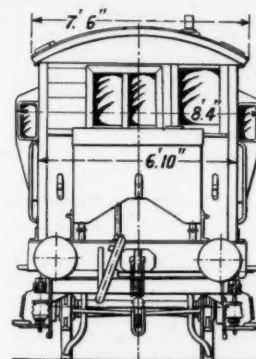
brakes for its fast freight trains as the braking force of these is provided by the stock forming the trains, and that the need for a heavy brake van at the rear is not essential as in the case of ordinary goods trains. The reason in this case arises primarily from the decision of the company to adopt d.c. electrification.

Before the amalgamation, the London & South Western section used d.c. and the London, Brighton & South Coast section a.c. current for their electric services; consequently in the course of the development of electric traction on the Southern Railway, the company had on hand 21 a.c. electric locomotives which had been purchased a few years earlier by the L.B. & S.C. Railway for the Coulsdon-Wallington services.

The electrical equipment was stripped out of the locomotives and various schemes were put forward for the utilisation of these vehicles which did not find favour. Then, because of intensive road competition, it became necessary to accelerate the West of England goods train services by running fully vacuum-

fitted trains. A suggestion was made that the redundant electric vehicles could be easily adapted as goods brake vans and provide a desirable standard of comfort for the guards working these trains. This scheme was adopted and during the years 1933 and 1934 the vans were put into service with such success that they became the prototype of the 25 vans constructed in 1936, one of which is illustrated on this page. As will be seen from the illustration, all-weather protection is provided for the guards, with liberal lookout facilities by means of side lookouts and glass windows at the ends of the body and verandahs.

Rolled-steel sections to British Standard Specifications are used for the construction of the underframes and body framing and these are suitably riveted together. Pockets for ballast are provided in the underframes, and steel plates are attached either by rivets or bolts to the top and



End view of bogie goods van

bottom flanges of the frame members for this purpose. Before the demand for steel scrap for war purposes, it was the practice to fill in the pockets with small steel scrap, but now concrete is used which has had the effect of reducing the weight of the vans by about 30 cwt.

Each van is fitted with the Southern Railway pattern self-contained buffers which embody the use of cast-steel cases, mild-steel plungers and wrought-steel heads; the latter are riveted to the plun-



One of the vacuum-fitted bogie goods brake vans of the Southern Railway

ger circumferentially and inside is fitted a helical steel spring.

The drawgear is in accord with R.C.H. standard-wagon requirements and consists of Gedge drawhooks, indiarubber concentric drawsprings with three-link couplings and screw couplings for the four-wheel and bogie vans respectively.

Body Construction and Equipment

The bodies of the vans are constructed as independent units and are bolted to the top of the underframes. This is a method of assembly which permits the spreading out of the work in the shops, economical building and, when necessary, facilitates repair to the bodies and underframes. The lookouts which are situated at cross corners in the body, are fabricated; the observation window portions are pressings, the outside portion is of steel panelling, with the parts riveted together. The remainder of the body and the verandahs are single sheeted with tongued-and-grooved boards and the inside of the enclosed portion is lined with plywood. Plain deal boards are used for the flooring, being laid on the upper steel plates forming the ballast pockets. A coal-fired stove with a coal bunker forms part of the equipment of each van. The woodwork in the vicinity of the stove is protected by steel panels.

Details of Brake System

Screw-type hand-brakes are fitted throughout and to reduce the turning of the brake handle to a minimum they are, in the case of the four-wheel vans, fitted with brake-block slack adjusters, thereby avoiding the necessity of frequently adjusting the brakes by the staff. The following is a brief description of this fitting:—Secured to the arm of the brake shaft, which is directly operated by the hand-brake screw, is a rod which is slotted and forked at one end and has a toothed rack at the other. The rod is secured to

the arm at the forked end by means of a pin and passes vertically through the floor into a slotted bracket on the brake column. In the slotted bracket of the brake column a pawl is fitted and held against the adjusting rod by means of a flat spring.

When the hand brake is applied, the pin in the slot rises until it lifts the rod and when the amount of lift equals the pitch of the teeth in the rack, the pawl automatically engages with the rod and prevents the brake shaft returning to its original position. The slot provides the initial movement necessary to maintain the required brake block clearance from the wheels. When the brakes require renewal the pawl is released by hand. The mechanism is encased to prevent it being interfered with by unauthorised persons.

A description of the brakes on the bogie brake vans may also be of interest. Here the vans are fitted with two 18-in. dia. vacuum-brake cylinders suspended from the underframe; each cylinder operates independently and directly, the bogie brake rigging by means of a cross shaft. With this arrangement of brake cylinders the piston stroke may vary as the result of differences in wheel diameter, unequal brake block wear, or brake adjustment in the respective bogies. This condition is safeguarded when applying the hand brake by the introduction of a compensating lever pivoted on the hand-brake screw nut. The lever engages with the arms of each brake shaft through the agency of adjustable links.

Hook-type arms are provided on each shaft, one for power and the other for the hand brake. When the power brake is in use the hook arm is lifted clear of the arm connecting the pivoted compensating lever on the brake shaft, and when the hand brake is applied the arm lifts clear of the arm connecting the brake piston to the shaft. This device can be seen on reference to the drawing of the van. The

usual Gresham & Craven guards' application valves and a vacuum gauge are fitted in the compartment.

Sandboxes are situated outside the verandahs and the release valves are actuated by a lever positioned adjacent to the hand brake.

Bogie Trucks and Details of Finish

The bogies of the fast service vans are of identical construction to those used for the steam and electric stock passenger vehicles and have an 8 ft. wheelbase with laminated side-bearing springs and helical bolster springs. The wheels of the four-wheel vans are of solid type; experience has shown this to be necessary when braking over long gradients.

The exteriors of the bodies on the sides and the underframes are painted dark brown, the ends Venetian red with white lettering. The ironwork is painted black except for the commode handles which are painted white. It is usual for the interior of the guard's compartment to be painted Venetian red to waist height with the upper portion and ceiling stone colour; the dado line is black, but as a wartime measure the interiors are now left unpainted.

It is inevitable in the railway world that all stock eventually acquires some pseudonym by which it is known among the staff who work and operate it. The two types of vans described in the foregoing article have proved no exception to this custom, and they are known domestically as "Pill boxes" in the case of the four-wheel type; the express vans are referred to as "Gondolas"—an apt description for a vehicle having a long underframe and short body.

We are indebted to Mr. O. V. Bulleid, Chief Mechanical Engineer of the Southern Railway, for the above particulars and also for originals of the dimensioned diagrams and photographs illustrating the vans.



West of England-Waterloo express passing Sidmouth Junction, Southern Railway
"King Arthur" class 4-6-0 No. 773, Sir Lovaine

Photo]

[J. B. Molesworth

RAILWAY NEWS SECTION

PERSONAL

MINISTRY OF SUPPLY CHANGES

The Minister of Supply has appointed General Sir Walter Venning, who retired recently from the post of Quartermaster-General, to be Director-General of the British Supply Mission in Washington, in succession to Mr. Edward P. Taylor, who has resigned on account of ill-health, but whose services, it is understood, will not be lost to the supply organisation. General Venning will take up his new duties as a civilian.

The Minister also has appointed Mr. J. C. Patteson, Director-General of Supply Services in the Ministry, to be Ministry of Supply Representative in Canada. Mr. Patteson is European Manager, Canadian Pacific Railway, but has been for the last two years with the Ministry, where he created the present organisation for the transport of workers and goods.

Mr. James F. A. Mann, Chartered Accountant, has been appointed Deputy Assistant Director at the Ministry of Supply.

In *The London Gazette* of September 25 it is announced that under authority of a Royal Warrant, the Viceroy of India has conferred the honour of Knighthood upon:

Mr. Bertie Munro Staig, C.S.I., Indian Civil Service, lately Financial Commissioner, Railways, whose name appeared in the New Year Honours List, 1942; and on the following gentlemen whose names appeared in the Birthday Honours List of June 11, 1942:—

Mr. Satyendra Nath Roy, C.S.I., C.I.E., Indian Civil Service, Secretary to the Government of India in the Department of Communications;

Mr. John Hugh Francis Raper, Member, Transportation, Railway Department (Railway Board), Government of India;

Sardar Bahadur Sardar Teja Singh Malik, C.I.E., Indian Service of Engineers, Chief Engineer, Central Public Works Department, Government of India.

The late Rt. Hon. Sir William Warrender Mackenzie, P.C., G.B.E., K.C., LL.D., first Baron Amulree, whose activities included the Presidency of the Industrial Court from 1919-26, and the Chairmanship of the Railway National Wages Board from 1920-26, left £162,644.

Major A. D. G. Shelley (late Royal Engineers), Chairman of the Bombay, Baroda & Central India Railway Company, whose death we recorded last week, had been Agent of the South Indian Railway before being appointed to a similar position with the Bombay, Baroda & Central India Railway; later he was given a seat on the board of the latter company, and, in 1916, he became Chairman. His connection with the B.B. & C.I.R. lasted for over 35 years. Major Shelley had been also a Director of the East Indian Railway Company.

Mr. R. E. Robins, C.M.G., O.B.E., General Manager, Tanganyika Government Railways, who, as recorded in our August 21 issue, has been appointed General Manager, Kenya & Uganda Railways & Harbours, was born in 1891. He was educated at Queen Mary's School, Basingstoke, and entered the service of the Great Western Railway in 1908. He was selected for training under the company's special training scheme for officers in 1920; and from 1919 to 1924 he underwent professional training

ger's Office. For a number of years she contributed notes on the work of the ambulance centre to *THE RAILWAY GAZETTE*.

Sir Charles J. Hambro, Chairman of the Great Western Railway Company, has accepted the Presidency of the Railway Convalescent Homes for 1943, in succession to Sir Robert A. Burrows, Deputy-Chairman of the London Midland & Scottish Railway Company.



Mr. R. E. Robins, C.M.G., O.B.E.
Appointed General Manager, Kenya & Uganda Railways & Harbours

at the London School of Economics, where he was awarded the Brunel Medal. Subsequently he became an Associate Member of the Institute of Transport. Mr. Robins entered the service of the Kenya & Uganda Railways & Harbours, in 1925, as Assistant Superintendent of the Line, which position he held for ten years. He was for a short period Superintendent of the Line, before he went to Tanganyika. Mr. Robins was awarded the O.B.E. in 1932; he was made C.M.G. in 1938.

Miss C. A. Ault, Secretary of the Great Western Railway Ambulance Centre, who retired on October 3, commenced her work in connection with the ambulance centre during the war of 1914-19, when she took over the duties of Secretary from Mr. W. G. Chapman, during his four years' service with the Armed Forces. On his return she acted as his assistant until 1929, when she became Secretary. Miss Ault has completed 30 years' service with the G.W.R., during 26 of which she has been a member of the staff of the General Mana-

To mark his year of office as President of the Railway Convalescent Homes, Sir Robert A. Burrows has presented a silver cup for competition between each of the homes. The cup will be presented to the home whose patients obtain the best score at darts during the year; but if, later on, any other game should become more popular the cup will be given for that game.

Colonel the Hon. J. J. Astor, M.P., who is a Director of the Great Western Railway Company, has been appointed to the board of Barclays Bank Limited.

The Right Hon. Lord Leathers, Minister of War Transport, has accepted the invitation of the Council to become an Honorary Member of the Institute of Transport. He hopes to attend the first luncheon meeting of the 1942-43 session, which is to be held at the Connaught Rooms, London, on November 3, when a record of his election will be presented to him.

The Southern Railway has appointed Mrs. G. M. Beeson to be Assistant Welfare Supervisor for women staff.

Mr. Cecil Bentham, M.Inst.C.E., M.I.Mech.E., M.Inst.T., has been elected President of the British Engineers' Association for the ensuing year. He has been successively a member of the Council (1930), a member of the Taxation Committee (1941.) and Vice-President (1941). Mr. Bentham is Chairman & Managing Director of Henry Simon Limited, and Chairman of Henry Simon (Engineering Works) Limited, Turbine Gears Limited, and of Tyresoles Limited; he is a Director of W. S. Barron & Son Ltd. He is a member of the management board of the Engineering & Allied Employers' National Federation. At present, Mr. Bentham is investigating, on behalf of the Machine Tool Control and the Admiralty, the machinery equipment of shipyards and marine-engine works. He has served also on a committee for distributing armament orders in the Manchester area to firms engaged on commercial work.

We regret to record the death of Mr. John MacGregor Laird, who had been Chairman of Cammell Laird & Co. Ltd. and a member of the Mersey Docks & Harbour Board.

At the meeting of general managers held at the Irish Railway Clearing House, Dublin, on October 6, Mr. G. B. Howden,

General Manager, Great Northern Railway (Ireland), was appointed Chairman of the General Managers' Conferences for the year 1943.

We regret to record the death at Westward Ho, on October 2, of Mr. J. E. Spagnoletti, the son of a former Telegraph Superintendent of the Great Western Railway, Mr. C. E. Spagnoletti, the inventor of the induced indicator needle still known by his name. Mr. Spagnoletti was born in 1860; he served a pupilage at the G.W.R. Swindon Works and then became associated with the private electrical contracting work which his father carried on in addition to his official duties. Taking into partnership Mr. Joseph Crookes, the second son of Sir William Crookes, he established the electrical engineering firm of Spagnoletti & Crookes Limited at Shepherds Bush, which he continued under his own name

after Mr. Crookes's death in 1902. This firm supplied much electrical signalling equipment to the Metropolitan, City & South London, Central London, and Great Northern & City Railways.

The work of Mr. Spagnoletti's father in the field of signalling is referred to in an editorial article on page 363.

We regret to record the death, which occurred suddenly on September 30, of Mr. Cecil Edward Squire, aged 60 years, Managing Director of Willford & Co. Ltd., railway spring manufacturers, of Sheffield. He was educated at Christ's Hospital and at Sheffield University, and received his early training with Ambrose Shardlow & Co. Ltd., of Sheffield. He had been connected in an executive capacity with the firm of Willford & Co. Ltd. since 1902. Mr. Squire, who was a leading authority on

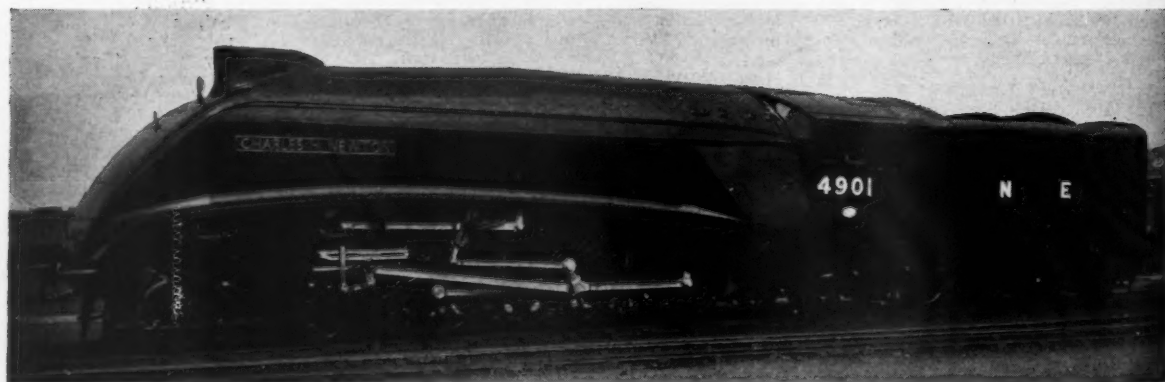
the subject of spring design and manufacture, was a life member of the Institution of Mechanical Engineers, and of the Sheffield Society of Engineers & Metallurgists; he was a member also of the Institution of Automobile Engineers, the Institution of Locomotive Engineers, the Junior Institution of Engineers, and the Iron & Steel Institute. He sat as a member of the British Standards Institution Committee for laminated and coil springs and was the author of many papers on spring-making and design. He had a particular charm of manner, and it can be said of him without fear of contradiction that he was liked by everyone with whom he came in contact.

Sir Esmond Ovey, who was until lately His Majesty's Ambassador at Buenos Aires, has joined the board of the Forestal Land, Timber & Railways Co. Ltd.

L.N.E.R. Class "A4" Pacific Locomotive, "Charles H. Newton"



Mr. C. H. Newton, Chief General Manager of the L.N.E.R., on the footplate of the "A4" Pacific class locomotive which has been named after him



L.N.E.R. Class "A4" Pacific locomotive, "Charles H. Newton," in new unlined black livery, showing the abbreviated lettering adopted as a wartime economy measure. The removal of the valances over the driving wheels and bogie to facilitate rapid servicing will be noted

TRANSPORT SERVICES AND THE WAR—161

London Transport Winter Services

The London Passenger Transport Board has completed its plans for the winter rail, bus, tram, and trolleybus services, and has announced their general trend. The winter services will be introduced on the following dates:—

Underground railways	October 28
Central buses, trams, and trolleybuses	October 28
Country buses	No change

The basic services to be provided during the rush and slack hours on all forms of transport will be much the same as at present. Blackout services for road vehicles will begin between 7 and 7.30 p.m., as last winter. From this hour vehicles on the principal bus, tram, and trolleybus routes will run at 10, 12, or 15 minute intervals, according to traffic demands. On the more important sections of road which are covered by more than one route, interworking of services results in shorter intervals.

Road vehicles will make their last journeys from Central London at 10.30 p.m. Country bus services are earlier in some instances. This early stopping affects theatre and cinema performances. Special late journeys will, however, be run for workers. On the Underground, last trains will leave Central London stations half an hour earlier, namely, at midnight instead of 12.30 a.m.

Country Area bus services will be maintained at their present level, and the times of last vehicles will remain unaltered. As already recorded, where the withdrawal of Green Line coaches would have left the public without means of reaching a railway station, bus services have been adjusted to provide connections. Other local

London Transport bus routes have been strengthened to carry the essential traffic displaced.

Interavailability Suspended

The Western Welsh Omnibus Co. Ltd. withdrew from Monday, October 5, and until further notice, the arrangements permitting passengers in possession of railway return tickets to make the return journey by bus, and holders of bus tickets to return by railway between certain stations. This step is understood to have been taken partly in pursuance of the Government policy of restricting unnecessary travel and partly because of difficulties arising from alterations in railway fares and the abolition of cheap day railway tickets.

Free Leave Travel

It has been widely reported in the daily press that Service men and women stationed less than 50 miles from home would be required to pay full railway fare when proceeding home on leave between October 2 and March 31 next, as none of the four-a-year free railway passes for seven-day leave would be issued during the six months affected.

This is not the case. We are officially advised by the War Office that the position is as follows. Except in special cases, soldiers are encouraged not to travel long distances (over 50 miles) on their short 48-hour privilege leave. During winter months concessions are to be issued only to men travelling less than 50 miles on this leave. Others pay full fare. Normal conditions remain for the 7-day leave period, and men living far from their units are urged to add their 48-hour leave to their 7-day leave. They can if they wish, and circumstances permit, wait 6 months and take 14 days of leave instead of 7. As it is essential to cut down long-distance travel during the winter, the new arrangements were made to avoid the cancellation of all winter leave traffic, which would have been a far greater hardship.

The concession rate to wives of Servicemen continues, although they too are urged not to travel unnecessarily and their voluntary co-operation in minimising travelling is essential if further restriction is to be avoided.

S.R. Fire-Fighting Arrangements

In June, 1941, Mr. E. M. Turnbull, Southern Railway Fire Officer, was entrusted with the work of strengthening the fire-fighting arrangements throughout the company's system, and he has contributed to the *Southern Railway Magazine* some account of the progress which has been made. There are now 131 trailer pumps spread over the system and located at points where the fire risk is considered to be above the average. To serve them no fewer than 1,569,000 gallons of static water have been placed in 149 specially-erected dams. In addition, 71 locomotive and other existing tanks, holding 2,692,000 gallons of water, have been made available. Water is also taken from the sea, streams, lakes, and wells, at 21 other places. There are seven inspectors whose duty it is to visit, at intervals not exceeding four weeks, places at which there are mains hydrants or trailer pumps; and all other places every six months.

These inspectors give instructions in the operation of the trailer pump, care of hoses, and the correct way to hold delivery branch. They also arrange lectures explaining the general practice of fire-fighting, emphasising

MINES WERE LAID IN ENEMY WATERS—

—Air Ministry communication



Is your journey
necessary?

RAILWAY EXECUTIVE COMMITTEE

A new R.E.C. press advertisement

among other things that fire hydrants must be used until they fail, and trailer pumps brought into use only when it is necessary to use static water or to boost up the pressure from hydrants.

At many Southern Railway stations, co-operational exercises with the local National Fire Service have been arranged, with mutually beneficial results. Railwaymen benefit through working with professional firemen, and the N.F.S. acquire useful knowledge of the ground inside railway premises on which they may have to operate.

Road Operators and War Damage Policy

John Hearn, Margaret Hearn, and Nellie Carrol, trading as P. Hearn, road transport operators, of Grays Inn Road, London, were recently fined £10, with costs of £157 7s., at Clerkenwell Police Court, on a summons alleging that for six months previous to August 26, 1942, they had been carrying on a business without there being in force a policy of insurance issued under the Business Scheme, War Damage Act, 1941. Defendants pleaded guilty. The value of their equipment was given as approximately £20,000. A Board of Trade accountant who had interviewed John Hearn on August 26, said that Hearn, when asked to produce a policy under the Act in respect of the equipment, was unable to do so. It was discovered later that the last date on which a policy had been in force was September 30, 1941. In consequence, the insurance fund had automatically lost the £150 due on the premiums for the quarters ended December 31, 1941, and March 31, 1942.

Customs Experiment in Ireland

With the object of reducing delay to trains by reason of the Customs examinations of passenger luggage, experimental arrangements were tried during the period



A woman tram driver in Sunderland. She is 46 years old and is the mother of 9 children

from Monday, October 5, to Saturday October 10, inclusive, whereby such examination by the Eire Customs officials was made on the portion of the journey between Dundalk and Drogheda on cross-border passenger trains working between Belfast and Dublin (and return). The only exception was the 5.40 p.m. train from Belfast to Dublin, which continued to be examined at Dundalk Station.

On every day during the experimental period passengers travelling to and from stations in Northern Ireland via Goraghowood were accommodated in the front portion of the train until the Eire Customs examination had been completed. The rear portion of the train, with carriages specially labelled, was reserved for the accommodation of passengers travelling to or from Dundalk or who changed there to or from other trains.

Normally there are Customs examinations at Dundalk and Goraghowood. In addition, those proceeding to Northern Ireland from Eire have to satisfy the Censor about correspondence and pictures, and also the Royal Ulster Constabulary about permits. The various processes often take a considerable time and result in through trains running late. As we close for press we have not learned of the result of the experiment, but doubtless if the arrangement proved satisfactory its permanent adoption will be considered.

C.P.R. Company of Victoria Rifles

The 2nd (Reserve) Battalion of the Victoria Rifles of Canada has been authorised to recruit one or more companies comprised exclusively of Canadian Pacific Railway employees in the Montreal area. Lt.-Colonel C. F. Ritchie, D.S.O., M.C., Officer Commanding the Vics, has placed in command of the new unit Captain Edmund H. Kent of the Canadian Pacific Insurance Department and also an instructor of the McGill C.O.T.C. It is the first time that a large corporation in Canada has recruited its own companies for the Reserve Army. Organisation work and recruiting are now under way and training will begin in the immediate future. The Canadian Pacific companies will adhere in every way to the normal routine of the Reserve Army, parading twice a week at nights, participating in the required number of week-end manoeuvres, and attending camp for two weeks. While the Vics' armoury in Cathcart Street, Montreal, will be their headquarters, the Canadian Pacific companies also will use the Windsor Station parking yard, St. Antoine Street, as a parade ground.

Salvage in Canada

Salvage posters urge everyone in Canada to "Get in the Scrap," but this admonition is not required by the Canadian Pacific Railway, which annually collects approximately 75,000 tons of scrap metal at its three large shops: Angus Shops, Montreal; Weston Shops, Winnipeg; and Ogden Shops, Calgary. The company has pursued this policy in peacetime, as in war, and hence is well equipped to handle scrap, of which the net reclamation value is half a million dollars. The three shops mentioned are the clearing houses of scrap for the system and the distribution is, roughly, 30,000 to 35,000 tons per annum at Angus Shops; 25,000 to 30,000 tons at Weston; and 15,000 to 20,000 at Ogden. From this accumulation, scrap is sold at the rate of 2,400 carload lots annually, or 45 cars of scrap a week.

The incoming scrap usually arrives in open-top cars to facilitate unloading at the scrap and reclamation docks by either

electric magnet or some other form of crane. The dock is so laid out, and delivery so arranged, that sorting of incoming scrap and loading of saleable scrap is effected with a minimum of lost movement. The loaded cars come in on one side of the dock, and the movement is across the dock to the outgoing loading trucks. During this movement the income scrap is separated into (1) saleable scrap; (2) scrap for the company's own use; and (3) scrap for reclamation. Between 130 and 150 men are employed continually at the scrap and reclamation docks. In present conditions reclamation is intensified, because of the difficulty in obtaining new material. Nothing that can be reclaimed economically for use by the company goes into the saleable scrap bin. At Angus Shops there is a wheel-foundry turning out 320 cast-iron wheels every working day. A wheel weighs approximately 750 lb., and 70 per cent. of the content is scrap.

U.S.A. Railway Track as Salvage

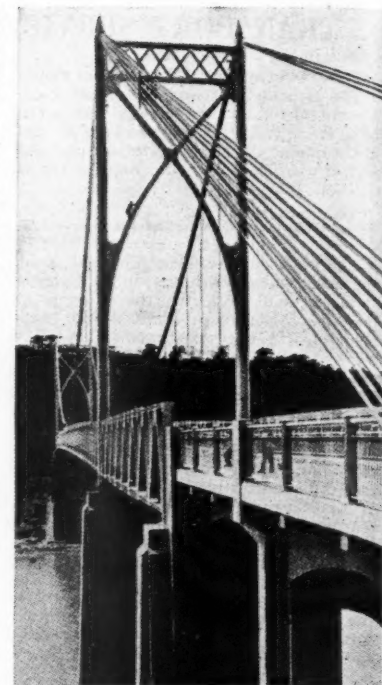
Approximately 200,000 tons of iron and steel rail, etc., have been requisitioned by the War Production Board of U.S.A. Abandoned tracks, including rails, points, fastenings, and permanent way equipment, have been taken, in some cases to be used in their existing form by the Army and Navy; in others sent direct to the steel mills to be scrapped; and the remainder re-allocated for various other essential uses. The first class (that taken for Army and Navy use) will provide new lines, and also repair materials in and around arsenals, docks, ammunition dumps, or transportation to new camp sites.

The Panama Canal Highway

The highway paralleling the Panama Canal and linking with the Pan-American Highway, which is known officially as the Trans-Isthmian Highway, is designed to provide an all-weather road from Balboa to Colon. Previously, the only land connection has been provided by the Panama Railroad. A concrete highway, about 25 miles long, was built from Panama City and Balboa to Madden Dam about 10 years ago to facilitate construction of the dam. The extension from near Madden Dam to the Atlantic end of the Canal is about 24½ miles long and has been cut through tropical jungle by U.S.A. Army Units in the Panama Canal zone. The new road, largely outside the Panama Canal zone on a right of way provided by the Republic of Panama, is also of concrete; it consists of two 10-ft. lanes separated by a 4-ft. zone of oil-treated gravel. By February of this year a through route was already in emergency use, and work of grading and paving was well advanced. Actual construction was expected to be completed by March 31, and probably the whole highway is now in regular use. One of the main objects of this highway is to make possible the rapid transfer of troops from one end of the Canal to the other, and the road may thus be expected to play an important part in Canal Zone defence.

Strategic Salvador Bridge

The Cuscatlan suspension bridge over the Lempa river in the Republic of El Salvador, was formally opened on June 6. The bridge, which is 1,350 ft. long, forms an important link in the direct route of the Pan-American Highway, and Salvador will soon have the first completely all-paved section of the highway in any of the American republics. The construction of the bridge, which began in March, 1940, was carried out by a United States company for the Salvador Government at a



Recently-completed Lempa river suspension bridge on the Pan-American Highway in Salvador

cost of \$700,000. This sum was defrayed by the Salvador Government without any outside assistance. The Lempa river is the largest flowing into the Pacific Ocean between the Colorado River in the U.S.A. and the Strait of Magellan at the tip of South America. It rises in Guatemala and flows southward to north-western Salvador. After turning east to the border of Honduras, it turns abruptly south and south-west through Salvador, cutting the country into three sections. Often the western and eastern sections have been isolated because of floods. Until the opening of the bridge all cargo had to cross by ferry, a dangerous and costly business when the floods were at their height. The new bridge is of the open cable suspension type; the suspended span is 820 ft. between towers, with 265 ft. back stays. The width of roadway is approximately 20 ft. between curbs, with five-foot pavements on each side. A brief description of the Pan-American Highway, with map, was published in THE RAILWAY GAZETTE of May 15, 1942, at page 569.

Civil Disobedience Sabotage on Indian Railways

It is now apparent from an official statement in the Indian Legislative Assembly by Sir Edward Benthall, Member, Indian War Transport Board, and from messages from the sub-continent, that widespread, though usually slight, damage has been done to Indian railways by *badmashis* (bad hats) incited by Congress, and possibly in the pay of the Japanese. The track has been tampered with in many places, resulting in at least 24 derailments, including one troop train, though without casualties. Other trains were less fortunate, however, their crews having been killed or injured.

Some 250 stations are reported to have been more or less seriously damaged, 53 having been burnt out, and many coaches have been burnt and goods vehicles damaged

and looted. Numerous telegraph lines were cut, but no bridges of importance were damaged. Some locomotives were tampered with, but not seriously. Though war traffic was temporarily delayed, this state of affairs did not last long, and no large-scale sabotage was reported. Railway workshops were practically unaffected.

Actually, most of the trouble occurred in a comparatively small area in Northern Bihar and the eastern part of the United Provinces, but even there it quickly subsided. It generally took the form of removing fishplates and rails, which were sometimes flung into rivers in flood.

It is satisfactory to note that the 730,000 railway workers were not affected by the disturbances or propaganda, and continued to work as usual; they are practically all Indians.

Australian Travel Restrictions

Restrictions on interstate passenger travel by rail (and on interstate travel to and from border stations) came into operation in Australia on July 1, as briefly recorded at page 18 of our July 3 issue. The object of the regulations is to reduce passenger travel and to confine it to essential requirements, so that both passenger and goods traffic vitally necessary to the war effort may flow more freely. Persons desiring to travel by rail between states must make application to the priority officer in the area where the journey is to begin. The order of priority permits is as follows:—

- (1) Defence personnel in uniform travelling on duty.
- (2) Persons on business of national importance associated with active defence requirements.
- (3) Persons on business of national importance but indirectly associated with defence requirements.
- (4) Persons on essential civilian business indirectly associated with defence requirements.
- (5)—(a) Defence personnel travelling on home leave passes.
- (b) Persons travelling for urgent and adequate private business reasons.
- (c) Persons having good reasons for travel (such as dangerous illness or the death of a near relative).
- (6) Persons absent from their permanent place of residence desiring to return home and giving sufficient reason to justify travel.
- (7) Persons travelling in cases where special hardship will result from prohibition.
- (8) Defence personnel travelling on leave and paying their own fares.

Priority permits to travel are not issued for non-essential travel such as those for pleasure or holidays, nor for womenfolk, relatives or friends travelling to visit, or live near, members of the forces; nor for cases of illness unless there is some specially-good reason for travel, minor illness of relatives, school children travelling on vacation, nor any other non-essential reason. Area Controllers have been appointed in each of the Australian States and these officers administer the priority regulations on behalf of the Commonwealth Land Transport Board.

Wagon Turn-round in Germany

To encourage more rapid loading and unloading of goods wagons, the Reichsbahndirektion Hamburg now pays RM. 10 for every wagon which is returned sufficiently before the expiry of the official time for loading to make it possible to despatch the wagon earlier than could otherwise have been done. On the other hand, when a wagon is not unloaded by the official time, it is compulsorily unloaded by the railway authorities at the cost of the consignee.

Industries in Eastern Germany

On October 1, 1940, freight rates in the transport of rolled iron from the west of Germany to the east, were limited to a maximum of RM. 25 a ton. This step was taken presumably so that the additional costs arising from the transfer of factories from the Ruhr and the Rhineland to places

in eastern Germany less vulnerable to R.A.F. attack should not fall upon the consumer so as to inflate prices. According to an official statement, published in the German press on July 30, the Reich Commissar for Prices has now reduced this maximum charge to RM. 20 a ton. The producers in the west are not to be called upon during the war to pay a special charge to make possible this reduction for firms in the east, and it must be assumed that the loss is either borne by the Reichsbahn out of wartime excess profits or is met by a State subsidy.

Non-Smoking Compartments in Germany

Stricter measures are being taken on the Reichsbahn and railways under German control against offenders of the non-smoking rules. Smoking is prohibited in all corridors and lavatories of non-smoking sections, in the corridors of all sleeping cars at all times, and in sleeping compartments between the hours of 10 p.m. and 7 a.m. No warnings are now given, and offenders are fined RM.2 on the spot.

The Mitropa in Wartime

Recently published figures of the Mitropa, the German sleeping and dining car company, for the year ended December 1941, show increased activities. Services in Belgium, France, and Poland (introduced in 1940) were increased, new services of sleeping cars were begun in the summer 1941 to Hungary, Roumania, Bulgaria, and Greece. In July, 1941, the numbers of cars run daily, compared with a year earlier, were 177 sleeping cars (against 166), 139 dining cars (against 154), and one kitchen car (against 11). The year's runs aggregated 74.4 million km., against 69.7 the year before. Four new sleeping cars of the new single-berth two-level type were introduced during the year and met with success, it is stated. The company has taken over the station restaurant and refreshment rooms at the Polish stations of Warsaw, Krakow, and Torun.

Diesel Units removed from Holland

All the diesel units of the Netherlands Railways were removed by the German military occupation authorities and sent to Germany during August. The booty consists of 40 articulated three-car units, 5 of which had a 350-h.p. motor unit and the others 400 h.p., with 2nd and 3rd class passenger accommodation and a luggage compartment. The trains were taken out of service after the German invasion, when diesel oil supplies ceased. The removal has not been carried out without public protests, as is evident from editorials in the quivering press urging the public to "grin and bear it," and saying that the German war machine, "freeing all Europe from the bolshevik danger," must be helped.

A Producer-Gas Railway in Estonia

The fuel shortage in Latvia and Estonia is stated to be serious, and steps are being taken to extend the use of producer-gas plants, using wood fuel, to the greatest possible extent. Producer-gas operation was adopted entirely on the Tallinn-Ziegelskoppel local railway in August last, with a view to easing the coal position. Trains have been discontinued, and all services are maintained by railcars fitted with wood-gas producer plants.

Transport Difficulties in Poland

In view of the size and intensity of the military operations on the Russian front, it is not difficult to credit the statement in

a recent issue of the *Krakauer Zeitung* that rail transport in Poland is being strained to the utmost. Priority is given to goods transport, and ordinary passenger transport seems to be nearly non-existent, with the exception of morning and evening services for workers.

To provide relief for the railways by means of both passenger and goods services on inland waterways, the Vistula Region Shipping Company was established recently with a capital of 3,000,000 zloty. A majority share interest is held by the Government (namely, the German occupation authorities) and 25 per cent. is in the hands of the Jaworzno Coal Company.

Fuel Decree in Portugal

A Decree has been issued by the Portuguese Government that all regular passenger and goods transport undertakings in Portugal must operate at least 25 per cent. of their vehicles on gas in one form or another (town, producer, methane, etc.).

New Railway in Bulgaria

The Bulgarian State Railways have in hand the construction of a narrow-gauge mineral railway line from the Stribe chromium mines to Kacanik station on the main line from Skopje northward to Kraljevo, just inside the part annexed from Yugoslavia. (See map, February 20, 1942, issue, page 260.) The line is 50 km. (31 miles) long, but the gauge is not stated.

Patriots Still Threaten Croat Railways

The Croat puppet state is continually in the throes of railway difficulties. Hardly has the traffic over one line been re-established before news comes of the "temporary discontinuance" of traffic on another line, due to Chetnik activities. For two months there was a break on the Sarajevo-Dubrovnik narrow-gauge line due to damage to the railway bridge near Lukac on the 16-mile section from Konjic northward to Bradina station. Through traffic was resumed on September 16. A few days afterwards, traffic was suspended on the 87-mile Sarajevo-Visegrad-Vardiste narrow-gauge line. Vardiste is at present considered the "frontier station" in respect of German-occupied Serbia; the first station on the eastern side of the "border" is Mokra Gora, 7½ miles away.

Railways in Slovenia

By reason of their geographical position on main routes between Italy and Germany, as well as on lines between Italy and the Balkans, the railways in Slovenia have assumed a high strategic importance in the Axis war machine. In many places these railways run through difficult country, such as along the side of ravines, and any dislocation is not easily adjusted quickly. Accordingly, the occupation authorities have taken vigorous steps to deter local patriots from interrupting the traffic, and severe penalties are reported to be imposed upon suspected saboteurs. The text of a recent decree by Robotti, the Commander of the Italian XI Army Corps has reached London. This states among other things: "All local passenger trains are to be suspended."

"No one is permitted to travel in transit trains without special pass."

"All buses are to be stopped."

"It is forbidden to travel from one locality to another whether by vehicle or on foot."

"It is forbidden to approach the railway lines nearer than a kilometre, except in towns. Trespassers will be shot immediately."

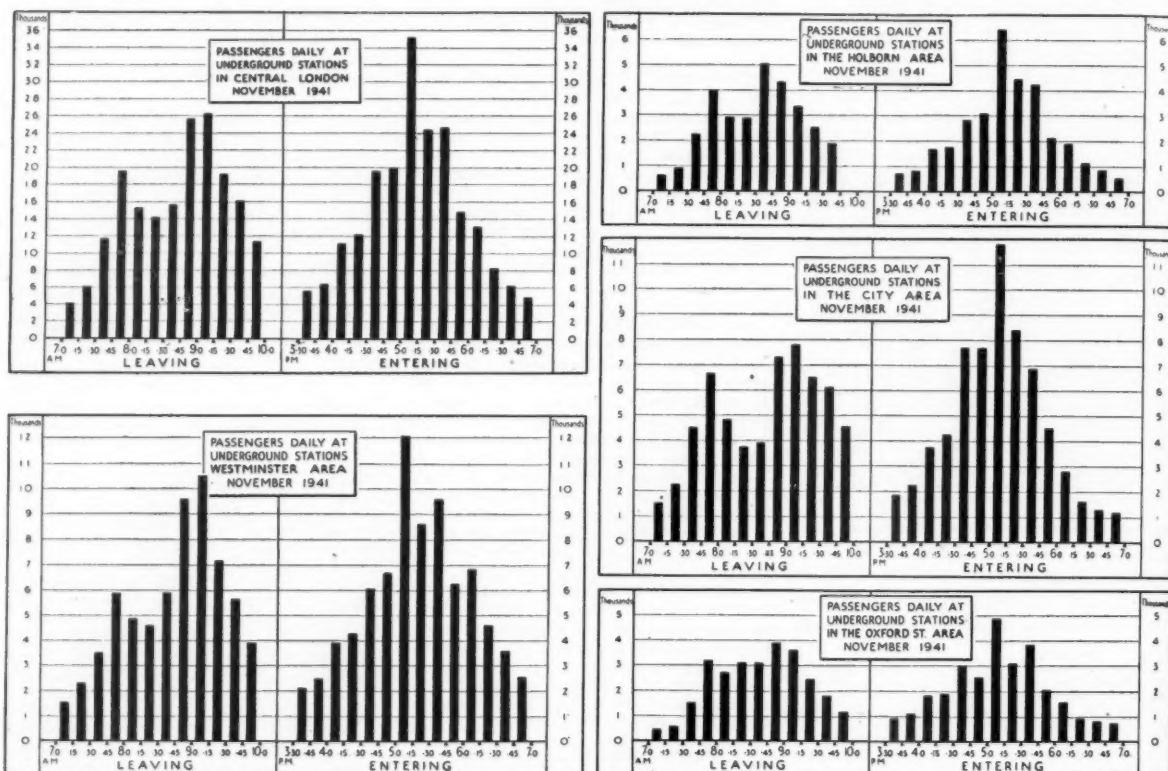
Staggering Working Hours in Central London

The Minister of War Transport, in a recent statement, mentioned a number of ways in which travellers could contribute to the smooth working of war transport this winter. Among these was a recommendation to employers and employees to

sign on between 8.30 and 9.30 a.m. and are, in consequence, often obliged to travel in discomfort. It is simpler to deal with large aggregations of traffic than with the small units; but it is in respect of the latter that London Transport has now issued an appeal, first to those who are employed, for their willing co-operation is essential (habit is not an easy thing to change!); and, secondly, to those who

to count persons entering and leaving stations than it is to count them at the many boarding and alighting points for buses. The loading figures for buses, trolleybuses, and trams are considerably heavier than those of the railways, for, apart from the millions of through passengers carried, surface vehicles act as feeders to railway stations.

School children also use transport a



Diagrams showing the numbers of persons leaving and entering Underground stations in various areas at different times

support schemes of staggered working hours. In winter, with fewer hours of daylight, business traffic tends to be concentrated into shorter periods, morning and evening. There can be no doubt that the spreading of this business movement over as long a time as possible is an important factor in urban transport.

Staggering schemes were introduced in many industrial areas last winter. The London & South Eastern Regional Board, which comprises representatives of all the government departments interested in production, and representatives of employers and labour, consulted the Minister of War Transport and the transport undertakings, and decided that in all important industrial areas local bodies should be established to deal with the traffic problem peculiar to each. A very considerable measure of success was attained; 35 local group committees were formed, and staggering schemes affecting 225,000 workers were begun. The formation of further groups has continued during the summer, and there are now 46 local committees responsible for the daily travel movements of some 500,000 workers.

The next step is to extend such schemes to Inner London, to black-coated workers, stores employees, clerks, school children, and so on, who have been accustomed to

are responsible for fixing the times of beginning and ending work.

The problem in the Central Area is depicted in one of the accompanying diagrams. This shows that the number of persons emerging from Underground stations in the Central Area between 8.15 and 8.30 a.m. is about 14,000. Between 8.30 and 8.45 a.m. there are nearly 16,000. Between 8.45 and 9 a.m., however, there are nearly 26,000, and a slightly greater number between 9 and 9.15 a.m. Thereafter, the numbers drop sharply until they are below 12,000 for the period between 9.45 and 10 a.m.

In the evening, the figures are even more striking. This is partly because many persons who have come to London on shopping and pleasure excursions are travelling back at the same time as the business folk. Between 4.45 and 5 p.m., the number of persons entering the Central Area stations is about 20,000, but between 5 and 5.15 p.m. it rises to 35,000. It then falls to 24,000 between 5.15 and 5.30 p.m. There is a similar number between 5.30 and 5.45 p.m. These figures indicate that the popular time for beginning work is still about 9 a.m. and the finishing time 5 p.m.

Figures are given for the London Transport railway system because it is easier

large scale in the London area, taking up space before 9 a.m. which is needed by workers travelling to factories, shops, and offices. Many schools have already helped by opening later in the morning, and it is hoped that all schools will follow suit during the present winter, at any rate for those pupils who must use public service vehicles.

MITROPA RESULTS.—Total receipts for the year ended November 30, 1941, of Mitteleuropäische Schlafwagen und Speisewagen A.G. (Mitropa) increased to RM. 56,100,000 from RM. 48,400,000 for the year ended November 30, 1940. In July, 1941, 177 sleeping cars and 139 restaurant cars were in operation, compared with 166 and 154, respectively, in July, 1940; and 74,400,000 car-km. were run, against 69,700,000 the year before. The net profit was RM. 944,238, inclusive of RM. 65,276 brought forward from the previous year; a dividend of 5 per cent. was paid, absorbing RM. 940,800. The four second class single-berth sleeping cars, some details of which were given in our January 16 issue (page 86), were completed in the course of the year. Some reference to Mitropa services in wartime is made on page 379 in "Transport Services and the War."

Questions in Parliament

Below are summarised Answers to Questions in Parliament affecting transport. The Minister concerned and the date of the Answer are given in parentheses

Bus Services in Rural Areas

The present urgent need for economy in fuel and tyres must inevitably result in some inconvenience to those who travel by bus, and I am aware that the inconvenience is often greater in country areas than elsewhere. The Regional Transport Commissioners, however, have endeavoured, and will continue to endeavour, to make arrangements which will avoid real hardship. The matter receives constant and close attention, and if Major A. M. Lyons (East Lancaster—C.) will let me have particulars of any specific cases which he has in mind, I will look into them. The public can assist by refraining from unnecessary journeys, and thus leaving the accommodation available for those who are obliged to travel. (Mr. P. J. Noel-Baker, Joint Parliamentary Secretary, Ministry of War Transport, September 30).

Redundant Motor Coaches

In addition to 306 motor coaches returned to operators and 157 others offered to their former owners, 658 coaches notified by Service Departments for disposal have been transferred to other Government Departments or broken down for spares. Of the 616 remaining, many have only recently become available for disposal. In some cases it has not yet been possible to identify the former owners from the impressment records and the Ministry of War Transport is considering whether, after expiration of a limited period, the vehicles should be offered to approved operators. Under this arrangement the vehicles should soon be disposed of. (Sir Andrew Duncan, Minister of Supply, September 30).

Ticket Collection at Colindale

The staff provided at Colindale, and the arrangements made in the station conform to the standards established by the London Passenger Transport Board for other stations with similar traffic. (Mr. P. J. Noel-Baker, October 1).

Petrol Rationing

No basic ration for motorcycles will be issued after the end of October. During November motor cyclists will be allowed to use at their discretion basic-ration petrol remaining in the tanks of their motorcycles. After the end of November, it will not be permissible to use in a motorcycle any petrol, however acquired, except for approved purposes. A Statutory Order giving effect to these decisions will be published in due course. (Major G. Lloyd George, Minister of Fuel & Power, September 29).

Damaged Railway Wagons

Of the railway wagons unloaded at Solihull reserve dump, up to August 31, 1942, 16½ per cent. were damaged. To the great majority the damage was only superficial, and it is not clear that all of it was caused by the unloading of coal. I have, however, asked the railway company for a report. (Mr. P. J. Noel-Baker, October 7).

Transport of Clyde Shipyard Workers

The Transport Consultative Committee for the Clyde, in conjunction with representatives of the shipbuilders' association and the trades unions, has formulated a scheme to improve travelling facilities for shipyard workers on the north bank by the

staggering of working hours, but so far the scheme has not been accepted. The employers generally expressed the view that the transport difficulties experienced in the early months of the war have been largely overcome, but in order to secure further improvement, I should be grateful if Mr. D. Kirkwood (Dumbarton Burghs—Lab.) would use his influence to help us in obtaining acceptance of the scheme of staggering which would enable the transport undertakings to improve the travel facilities for workers. (Mr. P. J. Noel-Baker, October 7).

Cheap Day Fares

I am afraid that the suggestion to reinstate cheap day fares in and to London where it can be shown that their abolition has not resulted in fewer trains or buses being run or passengers carried would prove impracticable. The Minister of War Transport appreciates that the withdrawal of the cheap-day fare may in some cases increase the cost of essential travel, but he considers that it was a necessary measure, and that to make exceptions would create unmanageable problems. Except for local journeys on the railways of the London Passenger Transport Board, monthly-return rail tickets are now available wherever the cheap-day rail tickets have been withdrawn. The sole purpose of the decision made was to reduce unnecessary travel, and not to increase transport revenue. As to the suggestion that I should find out after an experimental period whether travelling has been reduced, and, if it has not, re-establish the cheap fares, I am afraid that it would create differences of fares between different routes, which would lead to great grievances and perhaps undesirable diversion of traffic. (Mr. P. J. Noel-Baker, October 7).

Canal Transport

In co-operation with the Ministry of Fuel & Power, the Ministry of War Transport has made every effort to increase the use of the canals for the transport of coal, both in the Birmingham area and elsewhere. The principal difficulty in employing the full capacity of the canal system has been the shortage of labour for the canal wharves and for the crews of the canal craft. Women are being trained to man the craft, and several crews are already at work. We attach great importance to the use of canals to their maximum capacity. I have for the last few months given close personal attention to the problem and I hope to secure good results. Less than one-third of the capital invested in canals belongs to railway companies. Many of the railway canals are working. They are under Government control and we hope to make as good use of them as of the rest. (Mr. P. J. Noel-Baker, October 7).

Road Haulage Scheme

The administrative charges for traffic carried in chartered vehicles under the Road Haulage Scheme are estimated at 0.137 of a penny a ton mile. This estimate excludes the transport of meat and livestock. For traffic carried in vehicles hired through the Hauliers' National Traffic Pool, an addition must be made to cover the expenses of the pool. This is estimated at 0.061 of a penny per ton mile. The total administrative charge for pool traffic is thus 0.198 of a penny. (Mr. P. J. Noel-Baker, October 7).

Thefts at Liverpool Docks

No complete or comparable statistics of thefts in the Liverpool Docks are available. I am afraid, however, that, at Liverpool, as elsewhere, the number of thefts has undoubtedly increased since the war began.

The increase is due in part to the blackout, to the shortage of packing materials, and to the consequent difficulties of ensuring adequate supervision; the large profit to be made on the Black Market has also been an important factor. Vigorous measures to check the abuse have been taken, with the help of all the authorities at Liverpool, and firms concerned; the police have given special attention to the matter, and have secured a number of convictions. Many persons besides dock workers have been involved, but 414 dock workers who have been guilty of theft have been dismissed. (Mr. P. J. Noel-Baker, October 7).

Sale of Motorcars

I find that the advertisement, whereby guaranteed unregistered 8-h.p. ex-War Department motorcars are offered for unrestricted sale to the public, relates to vehicles purchased by unrestricted tender from the Ministry of Supply in November, 1941. Since February this year, all ex-Army motorcars have been sold to their original manufacturers for resale to the public under controlled conditions. These cars will not go back to the Government at a higher price than the Government sold them for to the ring. (Sir Andrew Duncan, October 7).

Railway Travel

Booking office clerks are not being instructed to inquire from applicants for tickets whether their journeys are really necessary. (Mr. P. J. Noel-Baker, October 8).

Street Signposts

It has been decided, in consultation with the military authorities, and within certain limits and subject to certain conditions, to re-erect signposts in towns. I am taking steps to give effect to this decision with the least possible delay. I will see that the suggestion that the signposts be placed low, so that they can be seen, is borne in mind. (Mr. P. J. Noel-Baker, October 8).

Canal Transport

The question of making the fullest possible use of canals for the relief of the railways has constantly engaged, and will continue to engage, my attention. The efforts made by the Minister of War Transport in co-operation with the canal undertakings and canal carriers, to promote the use of canals, have produced substantial results in spite of the difficulties caused by the shortage of the labour required. A considerable mileage of waterways has been allowed to fall into disuse and disrepair, and could only be made available for traffic by an expenditure of labour and equipment which could not at present be justified. (Mr. P. J. Noel-Baker, October 8).

Petrol Rationing

There is already a certain discrimination against high-powered cars in the mileages allowed for a given class of work, especially where the work is not directly related to the war effort. I am considering the intensification of this principle. (Major G. Lloyd George, October 8).

RECORD POSTAL TRAFFIC RECEIPTS FOR AUGUST.—The average daily receipts of the Post Office during the month of August last amounted to £188,659, compared with £183,173 in the same month of last year. The index number based on the average receipts in the corresponding period of 1924-34 (except 1926) rose from 150 to 156.9. This is a high record, and exceeds the similar record for August, 1941, by 3 per cent.; it compares with an average of about 148 for January-July.

Notes and News

Ransomes & Rapier Limited.—Interim ordinary dividend 2 per cent., tax free (same).

Madrid Underground Railway.—The official German news agency reports from Madrid that the Madrid Underground Railway is paying an interim dividend for 1942 of 3 per cent.

Limerick Harbour Dues.—The Limerick Harbour Board has received the sanction of the Minister for Industry & Commerce in Eire to increase all port dues by 100 per cent.

New U.S.S.R. Braking System.—The *Soviet Monitor* reports that preliminary experiments have been completed in connection with a new type of passenger-train brake invented by M. Matrosov, an engineer who has won the Stalin Prize. It is said to be easy to install and handle.

Brazilian Traction, Light & Power Co. Ltd.—The gross earnings of the company for August were \$3,995,358 and net earnings were \$2,155,193, an increase of \$115,605 on the corresponding period of last year. The gross earnings from January 1 were \$30,695,532 and the net earnings were \$1,374,684 higher at \$16,335,562.

Swiss Railway Accident.—Reuters reports that about ten people were killed, and some 20 injured, when a passenger and a goods train came into collision near Biel on October 2. The first two passenger coaches are stated to have been destroyed completely and two goods wagons to have been thrown into the Lake of Biel, which adjoins the line at that point.

Institute of Transport Sections.—As from October 1, the names of certain local sections of the Institute of Transport were changed as follows: the Birmingham & District Section is now known as the Midland Section; the Bristol & District as the Western Section; the Manchester-Liverpool & District as the North-Western Section; and the Newcastle-on-Tyne & District as the Northern Section. (The names of the Scottish, East Midland, and Yorkshire sections remain unchanged.)

Ransome & Marles Bearing Co. Ltd.—Net profit for the year to June 30, 1942, after charging depreciation £63,579, and making provision for taxation and bad and doubtful debts, was £119,434 (£113,295), and £76,305 was brought in. War damage insurance absorbs £15,867, and the final dividend, as already announced, is 15 per cent., making 20 per cent. for the year, and requiring £70,000 net. An allocation of £30,000 (nil) is made to reserve for contingencies, and directors' remuneration absorbs £3,000 (same), leaving £76,872 to be carried forward.

Tilling & British Automobile Traction Limited.—At an extraordinary general meeting of this company held at Brettenham House, Lancaster Place, Strand, London, on Monday, September 28, the following resolution was duly passed as a special resolution of the company:—"That it is desirable to carry into effect the reconstruction of the company provided for by the conditional agreement dated the 20th day of August, 1942, approved by special resolution passed the 17th day of September, 1942, and accordingly that the company be wound up voluntarily and that Walter Edward Bennett, F.C.I.S., of Brettenham House, Lancaster Place, Strand, London, Geoffrey Hubert Walsh, C.A., of

88, Kingsway, London, and Robert Prentice, C.A., of Crewe House, Curzon Street, London, W.1, be and they are hereby appointed joint liquidators for the purposes of such winding-up."

Barsi Light Railway Co. Ltd.—The directors have declared a second dividend on the ordinary stock of 2½ per cent. actual, payable on October 23. No final dividend will be recommended at the annual general meeting to be held later.

Alexandra Motor Coaches Limited.—Notice is given in *The London Gazette* that at the expiration of three months from September 29 the name of this company will, unless cause is shown to the contrary, be struck off the register, and the company will be dissolved.

Buenos Aires Transport.—The Argentine Chamber of Deputies has approved a resolution, according to a Reuters message, demanding an investigation into the action of the City of Buenos Aires Transport Corporation in taking over the passenger transport lines within the city.

Richard Thomas & Co. Ltd.—This company is paying on November 2 the fixed dividend at the rate of 6½ per cent. per annum on the participating preference shares in respect of the half-year to September 30, 1942. The dividend is non-cumulative until March 31, 1943, and is cumulative thereafter.

Egyptian Delta Light Railways Limited.—The following resolution will be submitted as an ordinary resolution, after the transaction of the ordinary general business of this company at the annual general meeting to be held on October 21, at 213, Gresham House, E.C. :—"That the meeting pursuant to the powers contained in Article 76 of the company's Articles of Association hereby resolves that until otherwise determined in general meeting the minimum number of directors shall be four instead of five as at present provided under the said Article."

Stothert & Pitt Limited.—Earnings for the year to June 30, 1942, amounted to £186,117 (£173,982). After deducting £142,172 for income tax and E.P.T., £4,327 for bank interest, and £796 for directors' fees, there was a profit of £38,823 (£26,437), and £22,876 was brought in. Preference dividend takes £1,995, and the dividend on the ordinary shares is again 10 per cent., less tax, and the bonus of 2½ per cent., less tax, is repeated, the dividend and bonus together absorbing £15,625 net. The sum of £20,000 (£7,554) is allocated to general reserve, and the amount to be carried forward is £24,078.

Pretoria Trolleybuses.—The first trolleybuses to run in the City of Pretoria, capital of the Union of South Africa, went into service on Sunday, August 20, 1939. The present service operates on the more thickly populated routes from the City to the outlying suburbs, and the vehicles employed comprise 24 single-deck and 10 double-deck buses, which maintain an average schedule speed of 15 m.p.h. and attain a maximum of 40 m.p.h. on the level. The system comprises 15 route miles, and further extensions are contemplated, for which additional vehicles have been ordered, but delivery has been delayed owing to the war. The chassis are by Leyland Motors Limited, the electrical equipment is of G.E.C. design and manufacture, and the bodies were built by Metropolitan-Cammell-Weymann Motor Bodies Limited at Birmingham. Regular passenger transport in Pretoria began before the Boer War with a

system of horse trams. In 1909 the trams were withdrawn in favour of horse buses, which continued to operate for a year during the time that electric tramways were being installed. At this period also the transport services were acquired by the City Council. The electrical equipment of these up to date trolley buses formed the subject of an illustrated article in a recent issue of the *G.E.C. Journal*.

Kitson Engineering Co. (London) Ltd.—Pursuant to Section 236 of the Companies Act, 1929, a general meeting of the members of this company will be held

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices	
			Oct. 9, 1942	Rise/ Fall
G.W.R.				
Cons. Ord.	43½	30½	52	+ 1
5% Con. Pref.	109½	83½	108	+ ½
5% Red. Pref. (1950) ..	105½	96½	105	—
5% Rt. Charge	129½	116	126½	+ ½
5% Cons. Guar.	128	110½	123½	+ ½
4% Deb.	113½	102½	109½	+ ½
4½% Deb.	115	105½	110½	—
4½% Deb.	121½	112	115½	+ ½
5% Deb.	132	122	128½	+ 1
2½ Deb.	70	62½	75½	—
L.M.S.R.				
Ord.	17½	11	24½	+ ½
4% Pref. (1923)	53	33½	59½	+ ½
4% Pref.	68½	48½	74½	+ ½
5% Red. Pref. (1955) ..	97½	77	99½	+ ½
4% Guar.	100	85½	100	+ ½
4% Deb.	105½	97	104	—
5% Red. Deb. (1952) ..	110½	106½	109½	—
L.N.E.R.				
5% Pref. Ord.	3½	2½	6	+ ½
Def. Ord.	2	1½	3½	+ ½
4% First Pref.	52½	33	58½	+ ½
4% Second Pref.	19½	10	28½	+ ½
5% Red. Pref. (1955) ..	79½	52	91½	+ ½
4% First Guar.	90½	74½	93½	+ ½
4% Second Guar.	80½	59	86	+ ½
3% Deb.	79½	68½	79	—
4% Deb.	104	91	103½	+ ½
5% Red. Deb. (1947) ..	106	102½	103½	+ ½
4½% Sinking Fund Red. Deb.	103½	99½	103½	—
SOUTHERN				
Pref. Ord.	65½	43½	71½	+ ½
Def. Ord.	15½	9	20½	+ ½
5% Pref.	107	77½	106½	+ ½
5% Red. Pref. (1964) ..	107	89½	107½	—
5% Guar. Pref.	128	111½	123½	+ ½
5% Red. Guar. Pref. (1957)	114½	107½	110½	—
4% Deb.	112	102½	108½	+ ½
5% Deb.	130½	119	127½	+ ½
4% Red. Deb. (1962- 67)	108½	102	108	—
4% Red. Deb. (1970- 80)	108½	102½	107	—
FORTH BRIDGE				
4% Deb.	99½	90½	107	—
4% Guar.	99	85½	103½	—
L.P.T.B.				
4½% "A"	120½	109½	116½	+ 1
5% "A"	130½	115½	124½	—
4½% "T.F.A."	103½	99½	101	—
5% "B"	117	102	114½	+ ½
5% "C"	46½	28½	49	+ 1
MERSEY				
Ord.	24½	19½	24	+ 1
3% Perp. Pref.	58	51½	59	—
4% Perp. Deb.	100	90	100	+ 1
3% Perp. Deb.	73½	63	77	—
IRELAND				
BELFAST & C.D.				
Ord.	4	4	9	—
G. NORTHERN				
Ord.	14½	3	25½	+ 1
G. SOUTHERN				
Ord.	14½	5	19	+ 4
Pref.	17	10	23½	+ 2½
Guar.	44	16	46½	+ 3
Deb.	61	42	66	+ 3

at 9, Low Pavement, Nottingham, on Monday, November 9, at 12 noon, for the purpose of having an account laid before them showing the manner in which the winding-up has been conducted, and the property of the company disposed of.

Pinchin, Johnson & Co. Ltd.—The interim dividend is 2½ per cent. (same).

Kitchen & Wade Limited.—Interim dividend is 12½ per cent. (same).

Train-Wrecking in India.—A passenger train on the Great Indian Peninsula Railway, bound for Peshawar, was wrecked on October 3, it is believed by fifth columnists; a rail had been removed. It is stated that 14 persons were killed and 30 injured.

Great Western of Brazil Railway Co. Ltd.—The Company announces that tenders of the 4 per cent. debentures which it invited on September 17 for purchase for the sinking fund are being accepted at the price of 64½ per cent.

Transport Exhibition at Charing Cross.—An exhibition entitled "Gangway, Please," showing the activities of the various forms of transport under war conditions, is to be opened today (October 16), at Charing Cross Underground Station, by Mr. P. J. Noel-Baker, Joint Parliamentary Secretary, Ministry of War Transport. The exhibition will be open every day (including Sundays) from 9.30 a.m. to 7.30 p.m., until November 7.

Chilean Land Transport.—The Chilean Minister of Public Works has sent a note to the Foreign Minister stressing the necessity for improving the lines of communication by land with neighbouring countries, especially with Argentina, to facilitate trade, which at present is restricted by sea due to the lack of ships. Customs revenues from the Andes route from Argentina to Chile terminus, via Juncal and Uspallata, which reached approximately 800,000 pesos in 1938, increased to approximately 5,000,000 in 1941. In the first six months of 1942, the revenues exceeded by 10,000,000 pesos those of the same period of the previous year.

Institute of Transport.—At a recent meeting of the Midland Section at Birmingham, Mr. C. Rayner-Smith, A.M.Inst.T. (G.W.R.), gave an address on "Transport—An Aspect of Safety." He outlined the safety measures which existed in connection with shipping, air, road, and rail transport, and stated that the first three have, in varying degrees, facilities for safety and protection afforded free of charge. But the railways had had to obtain safety results from their own resources. The protection of life had become a matter for the community and he thought that the question arose whether, in equity, the State itself should provide the means of meeting its safety requirements for public transport.

Plans for Swiss Water-Power Development.—A recently published technical study estimates the yearly increased demand for electric power in Switzerland at some 260 million kilowatts, or 350 million delivered at the source. About one-quarter of this would be for domestic purposes, and some 6 per cent. for transport; the rest is absorbed by agriculture and industry. In fifteen years, this increase would amount to 525,000,000 kw.-hr. At the beginning of 1941 the maximum yearly output of the present water-power plants was estimated at 7,800,000 kw. hr. It would be possible to increase the present installations to give a total figure of 21,000,000 kw. hr. a year. The reservoirs, however, would occupy

about 0.25 per cent. of the useful area of the country. It has often been asserted that the importation of fuel for heating purposes could be avoided by a greater utilisation of water power, but about 13 million kw. hr. would be needed to do this, and, in view of other calls for power, it is considered that the change is not practicable.

Manchuria.—A question asked of the Foreign Secretary in the House of Commons recently raised a point concerning the names Manchuria and Manchukuo. Mr. Eden stated that in all official communications the name Manchuria is used.

International Rail Conference.—Reuters reports, quoting the German wireless, that a conference on the co-ordination of European international railway traffic was concluded recently in Bucharest. It was attended by representatives of Germany, Italy, Roumania, Hungary, Croatia, Slovakia, and the occupied territories.

Paper Economy Exhibition.—A private exhibition, entitled "Design for Economy—Paper in Battledress," was opened on October 13 by the Rt. Hon. Brendan Bracken, P.C., M.P., Minister of Information, who was introduced by Mr. Stanley Bell, Chairman of the Waste Paper Recovery Association Limited, which has been responsible for its organisation. The exhibits include examples of the way in which the main-line railway companies and the L.P.T.B. have contributed towards economy in the use of paper; various forms and tickets are shown as they were in peacetime, and are contrasted with their present-day counterparts; and many interesting facts and figures are given to illustrate the reduction in paper consumption which has been effected in all departments.

Steam Turbine Locomotive with Individual Axle Drive.—With the object of obtaining a similar mechanical effect to that given by an electric locomotive with individual axle drive, now the usual practice for high-powered types, the French National Railways, it is stated, have been conducting trials with a new design of turbine locomotive, which functions without a condenser, constructed by Schneider of Creusot. The axle arrangement is given as 2-3-2 (or 2-Co-2 in electrical classification). The

boiler pressure is 25 atmospheres and each axle is driven by a turbine through a double-reduction gearing at 120 km.p.h. (75 m.p.h.) the output is 1,000 h.p. a turbine, when the latter revolves at 10,000 r.p.m.; the r.p.m. of the driving wheels are 490.

Arica & Tacna Railway Company.—The company announces that its representative in Peru has received £5,800 for stores and assets realised, but the question of compensation by the Government for the property taken over has not been decided, nor have all expenses and claims yet been met. It will be remembered that the company's railway was taken over by the Peruvian Government on February 1, 1942. Under its concession of 1857 the railway of 40 miles was to revert to the State on January 1, 1956.

Kings Cross Station is Ninety Years Old.—Kings Cross Station, which was opened on October 14, 1852, took its name from a large monument erected in 1830 in honour of King George IV, and known as "The King's Cross"; this was pulled down in 1845, but the name adhered to the locality. The station was the largest in London when it was built, at a cost of £123,000; the roof was constructed on the same principle as that of the Czar's riding school in Moscow. About £65,000 was paid for the two buildings formerly occupying the site and for excavation work. In 1894 the first track circuiting apparatus in England was installed in the tunnels outside Kings Cross. The station now covers 15½ acres, and the thirteen daily departures of 1852 had increased to about 250 by 1939. In peacetime, about 60,000 people use it daily and its parcels traffic exceeds 7,500,000 parcels a year.

Contracts and Tenders

The Egyptian State Railways have recently placed the following orders:—

A. S. Cooper & Company: Cutting Diamonds—Metropolitan-Vickers Electrical Export Co., Ltd.: Switch units.
B. J. Hall & Co., Ltd.: Arc lamp carbon.
The British Oxygen Co., Ltd.: Welding Material.
A.C.E.C.: Transformers.
Metropolitan-Vickers Electrical Co., Ltd.: Rotor resistance and motor.



Lady Royden, wife of Sir Thomas Royden, Chairman of the L.M.S.R., presenting the Challenge Cup and prize of £6 to Mr. P. L. Harris, representing the winners of the Grove Gardens Competition at L.M.S.R. headquarters. On Lady Royden's left is Mr. W. E. C. Lasenby, Assistant Chief Officer for Labour & Establishment

Railway Stock Market

Active conditions have continued to rule in Stock Exchange markets and in many directions there has been a broadening of interest, although, as was to be expected, the recent strong advance of values in some sections has induced a fair amount of profit-taking sales. Nevertheless, at the time of writing, the general undertone has remained very firm, and sentiment has been assisted by the tenor of the Prime Minister's speech. The prevailing view is that for the time being, at any rate, the rise in equity securities may make further progress. Moreover, British Funds and other leading investment stocks have shown a tendency to improve. After their recent substantial advance, home railway junior stocks attracted profit-taking; but on balance the reaction in values was very moderate. Subsequently, renewed demand was in evidence, based on yield considerations and on the attractions offered by home railway securities from the point of view of stability of dividend payments so long as the rental agreement is in force. At the time of writing, there has been a somewhat sharp reaction in L.N.E.R. first preference and also in L.M.S.R. 1923 preference, but Southern preferred showed a further rise on balance. Guaranteed stocks held recent gains, as did Great Western and Southern preferences; their investment status is, of course, widely recognised. Elsewhere,

gains of half-a-point were recorded in various of the debenture stocks of the main-line companies. Nevertheless, the chief feature among railway securities generally has been expansion of speculative activity in ordinary stocks of Argentine and other South American companies, and further gains in a wide range of preference and debenture issues. Sentiment has been assisted by the improving traffics and has remained under the influence of recent payments, particularly that of Havana Terminal, and that on Gt. Western of Brazil debentures on which a further payment has also been forecast. The main factor, however, which influenced the upward trend in South American railway stocks has been the assumption that before long, hopes of improved exchange facilities may be realised.

As compared with a week ago, Great Western ordinary stock has further improved from 51 to 51½ at the time of writing, and moreover the 4 per cent. debentures showed another fractional gain to 110. On the other hand, L.M.S.R. ordinary moved back from 25 to 24½; the 1923 preference from 60½ to 58½; and the senior preference from 75 to 74; but the guaranteed stock held its recent rise to par, while the 4 per cent. debentures improved half-a-point to 104½. Among L.N.E.R. issues, the deferred and preferred were slightly better on balance at 3½ and 6 respectively, while at 28 the second preference held all but a small part of the recent advance; there was

continued talk of the possibility of a slight improvement in the dividend. At 93½, L.N.E.R. first guaranteed kept its recent rise, as did the second guaranteed at 85½, but the first preference reacted from 59 to 57½. On the other hand, L.N.E.R. 5 per cent. 1955 preference moved higher to 91½. Among Southern issues, the preferred improved on balance by half-a-point to 71½, although the deferred was lower at 20½, compared with 21½ a week ago. Southern 4 per cent. debentures further improved from 108½ to 109; at the time of writing, the 5 per cent. preference and guaranteed stocks have remained at 106½ and 123½ respectively. London Transport "C," which received increased attention, further improved from 48½ to 49½; sentiment was influenced not so much by yield considerations as by the view that in any post-war reorganisation of transport there would apparently be no change of capital structure in the case of the L.P.T.B.

Reference has already been made to the market factors which have led to a broadening of speculative activity in Argentine railway stocks. B.A. Gt. Southern ordinary was fractionally better at 10½, and the 4 per cent. debentures rose from 58½ to 60. Among the numerous other gains, B.A. & Pacific 4½ per cent. debentures were a point higher at 51. United of Havana and Leopoldina debentures were 27½ and 51½ respectively. Canadian Pacific preference and debenture stocks also made higher prices.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open 1941-42	Week Ending	Traffic for Week		No. of Weeks	Aggregate Traffics to date			Shares or Stock	Prices					
			Total this year	Inc. or Dec. compared with 1941		Totals		Increase or Decrease		Highest 1941	Lowest 1941	Oct. 9, 1942	Yield % (See Note)		
						This Year	Last Year								
South & Central America															
Antofagasta (Chili) & Bolivia	834	4.10.42	£ 25,590	—	£ 1,320	40	£ 844,190	£ 759,840	+	£ 84,350	Ord. Sk.	10½	3½	12½	Nil
Argentine North Eastern ...	753	3.10.42	14,772	+	3,018	14	188,478	169,416	+	19,062	"	4	1	5½	Nil
Bolivar ...	174	Sept., 1942	5,518	+	1,381	40	40,709	34,854	+	5,855	6 p.c. Deb.	5	5	12½	Nil
Brazil ...	—	—	—	—	—	—	—	—	—	—	Bonds	8	2½	17	Nil
Buenos Ayres & Pacific ...	2,807	3.10.42	92,586	+	21,720	14	1,178,940	1,074,900	+	104,040	Ord. Sk.	7½	1½	6½	Nil
Buenos Ayres Great Southern ...	5,080	3.10.42	143,640	+	3,900	14	1,764,600	1,743,300	+	21,300	Ord. Sk.	10½	3½	10½	Nil
Buenos Ayres Western ...	1,930	3.10.42	50,700	+	180	14	674,640	666,600	+	8,040	"	9	2½	8½	Nil
Central Argentine ...	3,700	3.10.42	126,408	+	13,740	14	1,692,081	1,514,146	+	177,933	"	8½	2½	7½	Nil
Do ...	—	—	—	—	—	—	—	—	—	—	Dd.	9½	1	3½	Nil
Cent. Uruguay of M. Video ...	972	26.9.42	21,519	—	2,381	13	254,219	278,923	—	24,704	Ord. Sk.	9½	1	6½	Nil
Costa Rica ...	262	Aug., 1942	13,927	—	9,056	5	26,688	47,559	—	20,871	Sk.	15½	11½	14	Nil
Dorada ...	70	Aug., 1942	19,930	+	7,480	35	118,405	100,730	+	17,655	1 Mt. Db.	97	97	88½	6½
Entre Rios ...	808	3.10.42	21,648	+	4,602	14	250,122	250,860	—	738	Ord. Sk.	6½	1	6	Nil
Great Western of Brazil ...	1,030	3.10.42	14,000	+	2,300	40	403,200	357,000	—	46,000	Ord. Sh.	11½	1½	1½	Nil
International of Cl. Amer. ...	794	Aug., 1942	\$298,195	—	\$106,623	34	\$4,308,750	\$3,889,669	+	\$419,081	—	—	—	—	—
Interoceanic of Mexico ...	—	—	—	—	—	—	—	—	—	—	1st Pref.	—	6d.	1½	Nil
La Guaira & Caracas ...	22½	Aug., 1942	9,825	+	1,245	34	54,765	51,825	—	2,940	Ord. Sk.	4	½	5½	Nil
Leopoldina ...	1,918	19.9.42	29,936	+	977	38	1,131,351	960,607	+	161,744	Ord. Sk.	4	½	5½	Nil
Mexican ...	483	30.9.42	ps. 351,200	—	ps. 107,200	4	ps. 3,754,900	ps. 4,093,700	—	ps. 338,800	Ord. Sk.	—	—	—	—
Midland of Uruguay ...	319	July, 1942	11,961	—	2,549	4	11,961	14,510	—	2,549	—	—	—	—	—
Nitrate ...	382	30.9.42	7,899	+	1,751	25	140,095	107,301	+	32,794	Ord. Sh.	66½	1½	71	3½
Paraguay Central ...	274	2.10.42	\$3,641,000	—	\$12,000	14	\$50,816,000	\$47,029,000	+	\$3,787,000	Pr. Li. Sk.	43	29	51½	11½
Peruvian Corporation ...	1,059	Sept., 1942	85,636	+	4,091	14	251,242	218,753	—	32,489	Pref.	6½	1½	14½	Nil
Salvador ...	100	July, 1942	c 79,000	—	c 14,921	4	c 79,000	c 64,079	—	c 4,921	Ord. Sk.	52	24½	54½	3½
San Paulo ...	153½	27.9.42	37,625	—	1,400	39	1,417,333	1,444,579	—	27,246	Ord. Sh.	1	6½	1½	Nil
Taltal ...	160	Aug. 1942	5,235	—	750	8	11,725	9,165	—	2,560	Ord. Sh.	1	6½	1½	Nil
United of Havana ...	1,346	3.10.42	44,613	+	27,381	14	540,553	265,831	—	274,722	Ord. Sk.	2½	—	5	Nil
Uruguay Northern ...	73	July, 1942	1,137	—	220	4	1,137	1,357	—	220	—	—	—	—	—
Canada															
Canadian National ...	23,562	30.9.42	2,089,000	+	394,600	39	54,165,400	44,062,800	+	10,102,600	—	—	—	—	—
Canadian Pacific ...	17,049	30.9.42	1,407,800	+	202,600	39	37,425,200	31,691,400	+	5,733,800	Ord. Sk.	13½	7½	12½	Nil
India															
Barsi Light ...	202	July, 1942	23,685	+	8,903	17	63,285	67,635	—	4,350	Ord. Sk.	345	253	350½	5½
Bengal & North Western ...	2,090	July, 1942	261,600	—	5,267	18	1,080,300	1,092,128	—	11,828	"	101	95½	96	7½
Bengal-Nagpur ...	3,267	20.6.42	284,100	+	31,301	11	2,271,525	2,107,876	+	163,649	"	105½	101½	100	4½
Madras & Southern Mahratta ...	2,939	30.6.42	212,550	+	3,338	13	1,945,373	1,858,363	+	86,404	"	342	290	351½	4½
Rohilkund & Kumaon ...	571	July, 1942	58,275	—	3,099	18	234,300	272,651	—	38,351	"	100	87	98	4½
South Indian ...	2,402	20.6.42	179,171	+	43,616	12	1,376,295	1,113,057	+	263,238	"	—	—	—	—
Various															
Beira ...	204	July, 1942	71,494	—	—	43	743,603	—	—	—	Pr. Sh.	1½	29½	3	Nil
Egyptian Delta ...	607	10.8.42	11,442	+	3,483	20	139,046	89,984	—	49,062	B. Deb.	68	45	37½	9½
Manila ...	—	—	—	—	—	—	—	—	—	—	Int. Deb.	90½	86½	89½	6
Midland of W. Australia ...	277	July, 1942	27,869	+	9,221	52	27,869	18,648	—	9,221	—	—	—	—	—
Nigerian ...	1,900	25.7.42	70,391	—	19,240	18	924,271	910,397	—	13,914	—	—	—	—	—
Rhodesia ...	2,442	Jul., 1942	525,348	—	—	43	4,831,449	—	—	—	—	—	—	—	—
South Africa ...	13,291	22.8.42	778,597	—	10,795	21	16,034,688	15,279,983	—	754,705	—	—	—	—	—
Victoria ...	4,774	May, 1942	1,364,694	+	386,440	48	—	—	—	—	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ½.
† Receipts are calculated @ 1s. 6d. to the rupee

Argentine traffics are given in sterling calculated @ 16½ pesos to the £
‡ ex dividend